DMEA Form 9
Rev. 6/57

UNITED STATES
DEPARTMENT OF THE INTERIOR
Defense Minerals Exploration Administration

OFFICIAL DOCKET FILE

Idm-E NO._____

DMEA NO. 4786

2 MAY 1958

1189

Application
- [ ] Denied
- [x] Withdrawn

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

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

Folder No. 1:

Left Side

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

Right Side

- [ ] Project summary (final)
- [ ] Work Completed analysis (final)

All other material filed in chronological order including the following reports if checked:

- [ ] Field Team Semi-Annual Report for Certified Project
- [ ] Final Field Team Report (Tab)
- [ ] Operator's Final Report (Tab)
- [ ] Interim Field Team Reports
- [ ] Operator's monthly reports and all attachments
- [x] On-site Exam Report (Tab)
- [ ] Settlement Sheets
- [ ] Drill Logs

Additional Folders:

Left Side

Folders No._____: Reports

- [ ] Analysis of Semi-Annual Inspection Reports
- [ ] Project Summary (Interim) by DMEA Engineers

Right Side

- [ ] Field Team Semi-Annual Report for Certified Project
- [ ] Field Team Interim Reports
- [ ] Operator's Monthly Reports with transmittal, narrative and maps.

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

Folders No._____: Settlement Sheets

Folders No._____: Drill Logs

Folders No._____: Royalty material

17963

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
1605 Evans Avenue
Reno, Nevada

OFFICIAL FILE COPY
DMEA
RECEIVED JUL 15 1957

DATE	INITIALS	CODE

July 9, 1957

Memorandum

To: Operating Committee, DMEA, ~~Interior Bldg.~~
Washington 25, D. C.

From: Executive Officer, DMEA Field Team, Region II

Subject: Loan Application. (Copper-Zinc)
Shasta-Phelps Dodge Joint Venture
Sugar Loaf Area
Shasta County, California

Enclosed are three sets of MF-103, Application for Aid forms, relative to above subject. The fourth set has been retained in our files.

The Applicant will send us three bids on the diamond drilling and details on their current costs.

S. Ricker

Encls.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
1605 Evans Avenue
Reno, Nevada

DMEA
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DMEA
RECEIVED JUL 15 1957

DATE	INITIALS	CODE

July 12, 1957

Memorandum

To: Operating Committee, DMEA, Interior Building
Washington 25, D. C.

From: Executive Officer, DMEA Field Team, Region II

Subject: Loan Application (Copper-Zinc)
Shasta-Phelps Dodge Joint Venture
Sugar Loaf Area
Shasta County, California

Supplemental to my memorandum of July 9, 1957 relative to subject application, we are enclosing three copies of a letter dated July 11, 1957. It contains data to substantiate the Applicant's proposed costs.

S. Ricker

Attachments

SHASTA-PHELPS DODGE JOINT VENTURE

P. O. BOX 857
REDDING, CALIFORNIA

PHELPS DODGE CORPORATION
DOUGLAS, ARIZONA

SHASTA MINERALS & CHEMICAL CO.
612 DOOLY BUILDING
SALT LAKE CITY, UTAH

July 11, 1957

Mr. Spangler Ricker
Defense Minerals Exploration Administration
Reno, Nevada

Dear Mr. Ricker: re: Sugar Loaf Area - Shasta County, Cal.

On July 9, 1957, I submitted an application to your office for a DMEA loan covering exploration by diamond drilling from the surface in a part of the West Shasta Copper-Zinc District known as the "Sugar Loaf Area". I discussed this application briefly with your engineer, Mr. Warne, and with you. You were both of the opinion that I should substantiate my estimate of drilling costs by proposals from at least three reputable drilling firms.

On January 25, 1957, the Joint Venture, through the purchasing department of Phelps Dodge Corporation, called for bids on 10,000 feet of diamond drilling in the Balaklala Area. A copy of this proposal is attached. I also attach replies from MacPherson Drilling Company, Joy Manufacturing Company, Sprague & Henwood, Inc., and R. S. McClintock Diamond Drilling Company. As a result of this action, a contract for 10,000 feet of diamond drilling was entered into with R. S. McClintock Company and this company is at present doing our diamond drilling for us. I believe that the proposal and bids are of recent enough date to substantiate my present estimate.

MacPherson Drilling Company did 6,988 feet of diamond drilling for our account in this district from mid-summer of 1955 to January, 1957 and received the sum of $63,677.68 for this work, or $9.11 per foot. This included all drilling costs except pipe lines, roads, etc.

McClintock has completed 2,610 feet to date for a total cost of $29,120.95, or $11.15 per foot. The increase in cost is caused by our insistence on water return to the collar at all times and consequent increase in cementing costs as well as reaming and casing costs. I believe that we will be able to materially improve this cost by reducing the size of the hole at a shallower depth.

I hope that this information is sufficient to verify my estimate. Physical conditions in the Sugar Loaf area are similar to those in the Balaklala area and costs will be comparable.

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Very truly yours,

W J Walker

Shasta-Phelps Dodge Joint Venture
W. J. Walker

COPY

PHELPS DODGE CORPORATION
PURCHASING DEPARTMENT
DOUGLAS, ARIZONA

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RECEIVED JUL 15 1957
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January 25, 1957

Joy Mfg. Co., Contract Core Drill Div., Michigan City, Ind.
E. J. Longyear Co., Core Drill Department, Foshay Tower, Minneapolis, Minn.
Boyles Bros. Drilling Co., 1321 So. Main St., Salt Lake City 15, Utah
R.S. McClintock Co., W. 418 Ond Ave., Spokane, Wash.
Sprague & Henwood, Inc., Box 645, Grand Junction, Colo.

Gentlemen:

We plan, in the near future, to start diamond drilling operations on property located in ~~the~~ Shasta County, California, approximately seventeen miles northwest of Redding. This property is known as the Shasta-Phelps Dodge Joint Venture, with offices located at 1818 California Street, Redding, California. Mr. Walter C. Lawson, in addition to being General Manager of Phelps Dodge Corporation, is Manager of this property.

The work is to be performed in accordance with the general conditions as outlined herein and as set forth in the attached drilling specifications.

If you are interested in submitting a proposal for performing the proposed drilling, we shall appreciate receiving same in triplicate on the basis as outlined in the attached specifications foe the various phases of the work.

Proposals must be delivered to this office on or before February 15, 1957, and the contract will be awarded as soon thereafter as possible. If, after reviewing the specifications, you consider it desirable to visit the drilling area and inspect the available drilling cores, we suggest you contact either W. J. Walker or R. B. Patrick at the aforementioned address in Redding, California.

Proposals are to be submitted with the understanding that when the contract is awarded the following conditions will apply:

1. The Contractor must be prepared to move in and start the work, as set forth in the attached specifications, or or before April 1, 1957.

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2. The Contractor will be liable to the Owner for any loss, damage or injury to property of the Owner, and will idemnify and hold harmless the Owner, its officers, agents or employees, from and against any and all claims, liabilities, charges or expense to which they or any of them may be subjected on account of loss, damage or injury of any kind or nature whatsoever to the person or property of others, providing in each instance such loss, injury or damage arises from, or would not have occurred except for, negligent acts, defaults or omissions of the Contractor or its sub-contractors, or its or their agents or employees.

3. The Contractor will provide for the payment of Workmen's Compensation and Occupational Disease benefits, in accordance with the laws of the State governing the work, to employees of the Contractor and its sub-contractors engaged in the performance of any work on the Owner's premises, and will idemnify and hold harmless the Owner from and against all claims, liabilities, charges and expense to which the Owner may be subjected on account of injury, disease or death to such employees arising out of their employment on the Owner's premises, or travel to or from said premises.

4. The Contractor will provide public liability insurance, acceptable to the Owner, with limits of not less than $50,000.00 for any one person, and $100,000.00 for any one accident, under which the Owner shall also be named as an insured. Before commencing any work on the Owner's premises, the Contractor shall furnish the Owner with certificates that the Workmen's Compensation, Occupational Disease, and Public Liability insurance has been provided, and the Contractor shall maintain such insurance until the entire work has been completed and accepted.

Very truly yours,

signed: K. A. ABBES

Assistant General Purchasing Agent

KAAbles/rd
cc: WCL
EEM
WJW

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PROPOSED DIAMOND CORE DRILLING SPECIFICATIONS

SHASTA COUNTY, CALIFORNIA

1. **Footage**

   The Owner guarantees Contractor a minimum footage of 10,000 feet of diamond drilling under specifications to follow.

2. **Location**

   The drilling is to be done in the West Shasta Copper-Zinc District, about 17 miles northwest of Redding, California.

3. **Type of Drilling**

   The Owner plans to complete the holes of a minimum AX size. Maximum depth is estimated at 1500 feet, but most holes will be in the 500-700 foot range of depth. Hole locations, hole sizes, depths, and inclinations will be determined by Owner.

4. **Access**

   Access to the drilling area is by paved highway from Redding or adjacent communities to S hasta Dam, then 5 to 10 miles of unimproved mountain road.

5. **Travel Time**

   Normal travel time from Redding to the drill area will vary from 40 minutes to 1 hour 10 minutes, depending on the part of the area being drilled.

6. **Accommodations**

   There are no living or camp accommodations in the field area.

7. **Equipment**

   All necessary drilling equipment is to be furnished by the Contractor. The Owner will furnish 3000 feet of 1" pipe for water lines, as well as all necessary core boxes, sample sacks, and any additional sampling equipment required.

8. **Water**

   Water is available from numerous small streams in the area. The installation of needed water lines will be for Owner's account at Contractor's direct labor cost, including insurance, Workman's Compensation, etc., plus 10% for overhead. Contractor will furnish any pumps needed to supply water to the drills from the source.

COPY

9. Drill Sites

Access roads and drill sites will be constructed and leveled by the Owner.

10. Formation

The rock types expected are shales of the Kennett formation, metavolcanics of the upper, middle, and lower Balaklala formation, and possibly greenstones of the Copley formation. Sample cores of previous drilling are available for inspection.

11. Mobilization and Demobilization

Mobilization and demobilization costs are for the Owner's account. However, specific overall (not cost or cost plus) bids for each of these items are expected. Moving costs, that is, moving between drill sites, are for the Contractor's account.

12. Lost Casing

Casing left in the holes at Owner's request will be for Owner's account at cost. Owner will pay 50% of the cost of casing lost through normal drilling operations.

13. Sampling

Sludge samples are to be collected by Contractor for all footage drilled as directed by Owner. However, Owner's representatives or samplers will handle such samples beyond the collection stage.

14. Drilling Rates

Bids should be entered on a per foot basis for the following hole sizes:

4-1/8" or 4-1/4"	Drilling for and placing 3" I.D. pipe through alluvium.
NX	Drilling NX hole to 300 feet
BX	Drilling BX hole to 1000 feet
AX	Drilling AX hole to 1500 feet

Cost of placing and recovery of casing is for Contractor's account.

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15. Reaming Rates

Bids should be entered on a per foot basis for footage reamed for the following sizes:

Reaming	AX to BX
"	BX to NX
"	NX to 4-1/8" or 4-1/4"

16. Cementing Rates

Bids should be entered on a per foot basis for footage cemented for the following sizes:

AX

BX

NX

4-1/8" or 4-1/4"

17. Standby Time

Charges for such standby times as is requested by Owner should be covered by specific bid (not cost or cost plus.)

18. Qualification

The Contractor shall obtain at his own expense all licenses from Public Authorities which may be required for performance of the work, and shall comply with all applicable state and federal rules and regulations.

19. Drilling Rate

Contractor will begin operation of one drill on a two shift basis on or before April 1, 1957. In the event Owner believes a second drill necessary to maintain certain footage requirements, Contractor will, after due notice, furnish and operate such additional equipment at the same contracted rates. Bids should be submitted covering mobilization and demobilization of the second drill.

COPY

MacPHERSON DRILLING COMPANY

P. O. Box 447

Montrose, Colorado

March 2, 1957

Project: Shasta - Phelps Dodge Joint Venture
1818 California Street
Redding, California

Location: West Shasta Copper-Zinc District
Early Bird, Balaklala, & Angle Station.

Minimum Contract: 10,000 linear feet.(Ax- size minimum hole)

Maximum hole depth: 1500 linear feet.

Rates per hole:

1. Drilling and placing pipe from surface to bedrock.

0	to	50 ft. in depth,	at	$ 12.20 per ft.
50	to	100 ft. in depth.	at	14.30 per ft.
100	to	Bedrock,	at	16.30 per ft.

2. Drilling from top bedrock.

NX-size hole to 300 ft. in depth	at	11.90 per ft.

3. Drilling from top bedrock.

BX- size hole	to 250 ft. in depth.	at	8.90 per ft.
250 ft.	to 500 ft. in depth.	at	9.45 per ft.
500 ft.	to 750 ft. in depth.	at	10.60 per ft.
750 ft.	to1000ft. in depth.	at	12.00 per ft.

4. Drilling from top bedrock.

AX-size hole	to 250 ft. in depth	at	8.50 per ft.
250 ft.	to 500 ft. in depth.	at	9.15 per ft.
500 ft.	to 750 ft. in depth.	at	9.95 per ft.
750 ft.	to 1000 ft. in depth.	at	10.70 per ft.
1000 ft.	to 1250 ft. in depth.	at	12.65 per ft.
1250 ft.	to 1500 ft. in depth.	at	13.90 per ft.

5. Casing reaming rates.

Hx-size, reaming fro, placing, & recovery.	at	4.10 per ft.
BX-size, reaming fro, placing, & recovery.	at	3.60 per ft.
AX-size, reaming for, placing, & recovery.	at	3.10 per ft.

6. Cementing rates per ft. of hole.
Cost of cement or cement substitute to owners account.

Through overburden to bedrock.	at	$ 5.30 per ft.
HX-size hole top bedrock to 300 ft.	at	4.10 per ft.
BX-size hole top bedrock to 500 ft.	at	3.60 per ft.
BX-size hole 500 ft. to 750 ft.	at	4.00 per ft.
BX-size hole 750 ft. to 1000 ft.	at	4.80 per ft.
AX-size hole top bedrock to 500 ft.	at	3.25 per ft.
AX-size hole 500 ft. to 1000 ft.	at	3.75 per ft.
AX-size hole 1000 ft. to 1250 ft.	at	4.65 per ft.
AX-size hole 1250 ft. to 1500 ft.	at	6.20 per ft.

7. Standby time during drilling operations by owner's request or their representatives. To include surveying, setting plastic casing, waiting on drill sites or roads to be made, or preforming additional work in drill holes shall be at $ 10.00 per each shift hour.

8. If the use of drilling mud is required for the completion of holes or to increase core recovery. Owner shall reimburse contractor half the cost of the mud F.O.B. drill location.

9. Mobilization and Demobilzation costs.
Drill number one shall be a net charge of $1,000.00
Drill number two shall be a net charge of 1,375.00

MacPherson Drilling C.

By (signed: "M. MacPherson")

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JOY MANUFACTURING COMPANY
900 Woodland Avenue
Michigan City, Indiana

February 11, 1957

OFFICIAL FILE COPY
DMEA
RECEIVED JUL 1957
DATE CODE

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AIR MAIL

Phelps Dodge Corporation
Purchasing Department
Douglas, Ariz.

Subject: Proposed Diamond Core Drilling
Shasta County, Calif.

Gentlemen:

Based on a minimum guarantee of 10,000 ft. of drilling as listed in your specifications dated January 25th on the subject drilling, we would furnish one machine drilling on a 2-shift basis at the following prices:

Overburden Drilling	- 4 1/4"	@12.00 per ft.
NX Drilling	- 0. to 300. ft.	@12.00 per ft.
BX Drilling	- 0. to 500. ft.	@11.50 " "
BX Drilling	- 500. to 1000. "	@12.50 " "
AX Drilling	- 0. to 500. "	@11.00 " "
AX Drilling	- 500. to 1000. "	@12.00 " "
AX Drilling	- 1000. to 1500. "	@13.50 " "

The following prices will apply to footage reamed:

Reaming:	AX to BX	@$8.00 per ft.
	BX to NX	@$10.00 " "
	NX to 4 1/4"	@$12.00 " "

We are unable to estimate cementing on a per foot basis, so would like to take exception to this clause and bid cementing work at a flat rate of $12.00 per hour.

Standby time will be at the rate of $10.00 per hour.

Mobilization and demobilization will be at the rate of $1,500.00 for each drill.

The current cost of casing is as follows:

NX Casing	@$2.92 per ft.
BX Casing	@$2.16 " "
AX Casing	@$1.70 " "

COPY

50% of the above listed prices will apply for any casing lost in the hole. If casing is left in the hole at your request, the full amount will be chargeable.

We will expect you to furnish access roads to the drill sites so that our drill crews can reach the sites with a standard rear-wheel drive pick-up truck.

We are in a position to start this work with one machine on April 1st.

If you find the above prices acceptable, you may advise us so that we may have a formal core drilling agreement drawn up for your consideration.

Thank you for allowing us to quote on your requirements.

Yours very truly,

JOY MANUFACTURING COMPANY

signed: J. M. Murray

J. M. Murray, Asst. Mgr.
Contract Drill Division

JMM/et

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SPRAGUE & HENWOOD, INC.
P. O. Box 645
Grand Junction, Colorado

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DATE CODE

February 14, 1957

Phelps Dodge Corporation
Purchasing Dept.
Douglas, Arizona

Refer: K.A.A.

Gentlemen:

In reply to your invitation dated January 25, 1957, we herewith submit our proposal for diamond drilling on the Shasta - Phelps Dodge Joint Venture, property near Redding, California.

PROPOSAL:

Item 1. Mobilization and Demobilization
Lump Sum $3000.00

Item 2. Schedule of Prices for Drilling

A. 4 1/8" or 4 1/4" Drilling for and placing 3" I.D. pipe through alluvium . . . . . $ 9.50 per ft.

B. Drilling NX hole to 300 feet . . . . . 14.95 per ft.

C. Drilling BX hole to 1000 feet . . . . . 14.40 per ft.

D. Drilling AX hole to 1500 feet . . . . . 13.90 per ft.

Item 3. Reaming Schedule

A. Reaming AX to BX . . . . . $5.50 per ft.

B. Reaming BX to NX . . . . . 6.25 per ft.

C. Reaming NX to 4 1/8" or 4 1/4" . . . . . 7.00 per ft.

Item 4. Cementing

A. Cementing AX hole . . . . . $2.50 per ft.

B. Cementing BX hole . . . . . 2.50 per ft.

C. Cementing NX hole . . . . . 2.75 per ft.

D. Cementing 4 1/8" or 4 1/4" hole . . . . . 3.25 per ft.

COPY

Item 5. Standby Time

For rig and crew . . . . . $10.50 per hr.

Item 6. Mobilization and Demobilization

For additional rig and crews . . Lump Sum . . . $3000.00

This proposal is based on a minimum footage of 10,000 feet and subject to conformance with your specifications covering this program as attached to your letter of January 25, 1957, whereby:

1. Owner will furnish 3,000 feet of 1" pipe for water line, as well as all necessary core boxes, sample sacks and any additional sampling equipment required.

2. Installation of needed water lines will be for Owner's account at Contractor's direct labor cost, including insurance, Workman's Compensation, etc., plus 10% for overhead. Contractor will furnish any pumps needed to supply water to the drills from the source.

3. Access roads and drill sites will be constructed and leveled by the Owner.

4. Casing left in the holes at Owner's request will be for Owner's account at cost. Owner will pay 50% of the cost of casing lost through normal drilling operations.

If contract is awarded to Sprague & Henwood, Inc., it is understood that conditions 1, 2, 3, and 4 as outlined in your letter of January 25, 1957, will apply.

We trust you will find this proposal acceptable.

Very truly yours,

SPRAGUE & HENWOOD, INC.

signed: Robert R. Carver

Robert R. Carver
Western Manager

RRC:jmt

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LONGYEAR

E. J. Longyear Company
General Offices, Foshay Tower
Minneapolis 2, Minnesota

February 14, 1957

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Mr. K. A. Ables
Assistant General Purchasing Agent
Phelps Dodge Corporation
Douglas, Arizona

RE: K.A.A.

Dear Mr. Ables:

Reference is made to your letter of January 25, in which you set forth the Specifications for the drilling of some 10,000 feet at the West Shasta Copper-Zinc District, near Redding, California.

Upon receipt of this request we had our field superintendent, Mr. E. G. Tucker, proceed to the site where he spent considerable time with your Mr. R. B. Patrick examining the property. This examination leads us to believe that the formations to be drilled are similar to those in which we have had considerable experience in the same general area.

The drilling conditions are such that no intelligent estimate can be made with respect to progress per shift or diamond cost. Since we can not determine within reasonable limits the cost of these two items, it is not possible for us to submit a per foot price bid for this drilling. We, therefore, deeply regret that we will be unable to participate in this bidding.

We very much appreciate your interest in our services, and trust that you will continue to favor us with requests to bid on your diamond core drilling.

Sincerely,

E. J. LONGYEAR COMPANY

signed A. F. Pickard

Assistant Manager
Contract Drilling Division

A.F.Pickard:bal

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HOAGLAND AND DODGE DRILLING COMPANY
incorporated

H A D R I L C O

Tucson, Arizona, U.S.A.

February 18, 1957

Mr. K. A. Ables
Purchasing Department
Phelps Dodge Corporation
Douglas, Arizona

Dear Sir:

We thank you for your letter of Jan. 25th concerning the Shasta-Phelps Dodge drilling project.

I visited the property last week and Mr. Patrick spent several hours showing me the drill locations, and the cores and logs obtained from previous drilling.

I am of the opinion that our available equipment is too heavy and that we are too far from the job to permit the submission of a competitive bid.

We would appreciate hearing from you again when you have other drilling projects and particularly projects involving deeper holes and/or difficult overburden problems.

Yours very truly,

signed: J. A. Hoagland

J. A. Hoagland

cc: W. C. Lawson
E. E. Maillot

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R. S. McCLINTOCK DIAMOND DRILL COMPANY

W. 418 2nd Ave.
Spokane, Wash.

February 18, 1957

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Mr. K. A. Ables, Purchasing Agent
Phelps Dodge Corporation
Douglas, Arizona

Dear Mr. Ables:

In response to your invitation to bid under date of January 25, 1957, we wish to quote as follows:

1) We propose to furnish one truck mounted drill for vertical holes, together with personnel, ample supervision, and all accessories for performance of this work.

2) We are prepared to meet your Company's requirements No. 1, No. 2, No. 3, and No. 4.

3) We shall mobilize the one drill job for the lump sum of $1000.00 and demobilize for $750.00. These charges will apply in the event a second unit is required.

4) We agree to comply with specifications set forth in No. 13 - Sampling, and of course agree to the No. 12 - Lost Casing clause.

5) Referring to No. 14, Drilling Rates, we quote as follows:

4-1/8" or 4-1/4" Drilling and placing 3" I.D. pipe through alluvium.....$9.75/ft.

NX Drilling NX hole to 300 feet..... 7.95/ft.

BX Drilling BX hole to 1000 " .....
0 - 500 feet..... $ 6.75/ft.
500 - 1000 " ..... 7.75/ft.

AX Drilling AX hole to 1500 feet .....
0 - 500 feet.....$ 5.25/ft.
500 - 1000 " ..... 6.50/ft.
1000 - 1500 " ..... 7.75/ft.

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6) We bid as follows on No. 15 - Reaming Rates:

Reaming	AX to BX	$ 3.25/ft.
"	BX to NX	3.75/ft.
"	NX to 4-1/8" or 4-1/4"	4.25/ft.

7) We quote as follows on No. 16 - Cementing Rates:

AX	$ 3.50/ft.
BX	4.00/ft.
NX	4.50/ft.
4-1/8" or 4-1/4"	5.00/ft.

8) Contractor requests, in reference to No. 17 - Standby Time, reimbursement at the rate of $8.00 per hour.

9) Contractor expects to meet requirements set forth in No. 18 - Qualification, and No. 19 - Drilling Rate.

We wish to thank you for the opportunity to furnish your company our quotation, and to assure you that, in the event we are successful bidders, the job will be well supervised and properly run.

Yours very truly,

R. S. McCLINTOCK COMPANY

signed Philip H. Irwin

By_____
Philip H. Irwin

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BAILES BROS. DRILLING COMPANY
1321 South Main Street
Salt Lake City 15, Utah

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February 12, 1957

Phelps Dodge Corporation
Purchasing Department
Douglas, Arizona

Gentlemen:

We submit the following proposal for drilling on a property located in Shasta County, California, and known as the Shasta-Phelps Dodge Joint Venture property. This proposal is based on a minimum of 10,000 feet and Diamond Core Drilling Specification of January 25, 1957:

1. Mobilization - $300.00 per drill.

2. Drilling rate per foot.

   (a) Drilling for and placing 3" I.D. Pipe through alluvium - $7.00 per foot.

	AX	BX	NX
(b) 0 - 300 feet	...	..	$9.60
0 - 500 feet	$7.90	$9.00	
500 - 1000 feet	$8.90	9.70	
1000 - 1250 feet	10.30		
1250 - 1500 feet	11.30		

3. Reaming if required -
   AX to BX Size Hole - $3.60 per foot.
   BX to NX Size Hole - $4.30 per foot.
   NX to 4-1/8" or 4-1/4" Size Hole - $5.00 per foot.

4. Cementing if required -
   AX size hole - $3.50 per foot.
   BX size hole - $3.70 per foot.
   NX size hole - $4.10 per foot.
   4-1/8" or 4-1/4" size hole - $4.40 per foot.

   We offer as an alternate, and recommend as more satisfactory to performance of cementing by the foot, an hourly basis of $10.00 per hour, plus cost of cement or cement substitute.

5. Standby time will be charged for at the rate of $10.00 per hour.

If we should be the successful bidder, we would expect to be operating on a two shift basis on or before April 1st, 1957.

Thank you for calling on us, and we trust our proposal will receive favorable consideration.

Very truly yours,
signed: P. A. Park

P. A. Park
Ass't. Manager, Drilling Division

PAP:bg

COPY

SELBY DRILLING CORPORATION
319 Broadway P.O. Box 450
Boise, Idaho

Address reply to:

P. O. Box 36
Orangevale, Calif.
February 21, 1957

Phelps Dodge Corporation
Purchasing Agent
P. O. Box 552
Douglas, Arizona

Gentlemen:

Confirming our verbal quotation, the following is our proposal for exploratory drilling on your property in Shasta County, California.

Item No.	Description	Quantity	Unit Price
11.	Mobilization	Lump Sum	$1,000.00
	Demobilization	Lump Sum	250.00
14.	Drilling NX hole to 300 ft.	LF	14.00
	Drilling BX hole to 1000 ft.	LF	12.50
	Drilling AX hole to 1500 ft.	LF	10.50
15.	Reaming AX to BX	LF	5.00
	Reaming BX to NX	LF	6.00
	Reaming NX to 4 1/8" or 4¼	LF	3.00
16.	Cementing AX	LF	4.00
	Cementing BX	LF	4.00
	Cementing NX	LF	4.00
	Cementing 4 1/8 or 4¼	LF	4.00
17.	Standby Time	Hr.	15.00

The above work to be performed in accordance with specifications accompanying your letter of February 18, 1957.

Very truly yours,

SELBY DRILLING CORPORATION

signed: R. E. Selby

R. E. Selby

RES:mj

C
O
P
Y

Form MF–103
Revised Feb. 1957

UNITED STATES
DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS EXPLORATION ADMINISTRATION

Budget Bureau No. 42–R1035.3
Approval expires June 30, 1958

APPLICATION FOR AID IN AN EXPLORATION PROJECT

PURSUANT TO DMEA ORDER I, UNDER THE DEFENSE PRODUCTION ACT OF 1950, AS AMENDED

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

SHASTA–PHELPS DODGE JOINT VENTURE
P. O. BOX 857
REDDING, CALIFORNIA

(PHELPS DODGE CORPORATION, DOUGLAS ARIZONA, and SHASTA MINERALS & CHEMICAL COMPANY, SALT LAKE CITY, UTAH)

APPLICANT NOT TO USE THIS BLOCK

Docket Number	4786
Date Received	7/15/57
Government Participation %	
Region	II
Division Code	500

BUSINESS ORGANIZATION (Check one)

- Individual [ ]
- Corporation [ ]
- Partnership [ ]
- Other (Specify) [X]

State in which firm is organized: See attached

LIST CORPORATE OFFICERS OR PARTNERS HERE, IF APPLICABLE

Name	Address	Title
See attached		

RECEIVED JUL 15 1957 D.M.E.A.

Mineral(s) for which you wish to explore: See attached

Estimated Cost of Project: $

LOCATION OF PROPERTY

Name	County	State
See attached		

GENERAL INSTRUCTIONS

Before filling out this application, please read DMEA Order–I, Amended, "Government Aid in Defense Exploration Projects." 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 four 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 1, existing mine workings and geology in item 2, and the proposed exploration project in item 4. 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 2(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 Defense Minerals Exploration Administration, Department of the Interior, Washington 25, D. C., or with the nearest DMEA 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.

June 29, 1957
Dated

W. J. Walker
BY *(Signature)*

Supervisor
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. *Applicant's Property Rights:*

(a) 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 land adjacent to the proposed project area which you own or control. Describe any part of the project land or workings which should not be subject to Government lien for royalty payments. If the land consists of unpatented claims, state the book and page number for each recorded location notice, including amended locations, and the place where recorded (courthouse, recorder's office, county, and state).

(b) State all the names by which you know the property.

(c) State your interest in the land, whether owner, lessee, purchaser under contract, or otherwise. If you are not the owner, submit with this application one exact copy of the lease, contract, or other document (with address of owner) under which you control the property.

(d) Describe all liens, mortgages, or other encumbrances on the property.

2. *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 lands, including existing mine workings. Describe all production facilities.

(b) State your interest, if any, in operations stated in 2*(a)*.

(c) State, as far as 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 on the property giving quantities and grades and sampling methods used, supporting 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 may have, indicating on each whether you require its return to you.

3. *Accessibility of Project:*

(a) To aid DMEA representatives who may be required to examine the property, state the name and address of the person who will meet the DMEA representative; give directions for reaching the property; and describe accessibility of the property including the mine workings.

(b) Name the shipping and supply points and places where employees reside and state the distances between them and the property.

4. *The Exploration Project:*

(a) Describe fully the proposed exploration project giving individual footages and sizes of openings *for each item of work.* Use narrative, maps, plans, and longitudinal and cross sections as necessary. Show the 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 *property boundaries* or to the closest identifiable corner.

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

(c) In the event that an exploration contract with DMEA is executed, how soon will the work start and how many months will be required to complete it? State your anticipated average daily or monthly rate of progress for each type of work.

5. *Experience:*

State your operating experience and background with relation to your ability to carry out this exploration project, and also that of the person or persons who will supervise the operations.

6. *Estimate of Costs:*

Furnish detailed estimates of the costs *for each item of the work proposed in 4(a)* under the headings listed below with a total for each heading and the estimated total cost of the project. Costs for any work to be performed by an independent contractor should be shown separately under category *(a)* below. Costs for any work that is not to be performed by an independent contractor should be given in detail under categories *(b)* through *(g)*.

(a) Independent contracts. State the cost of any proposed independent contract for the performance of all or any part of the work, expressed in units of work, such as per foot of drilling, per foot of drifting, per hour of bulldozer operations, 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. For necessary supervision, engineering and geological services, and labor, include an itemized schedule of numbers, classes, rates of wages, salaries or fees, and periods of employment. State whether these technicians and employees are available.

(c) Operating materials and supplies. List items of material and supplies with their cost. 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 operating equipment to be used giving specifications and indicating how each item is to be acquired – i.e., rented, purchased, or provided by the applicant. If it is rented or purchased, state the estimated rental or purchase price. If it is to be furnished by the applicant, give its present fair market value.

(e) Initial rehabilitation and repairs. Describe the type and the cost of necessary *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 on the exploration project.

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

(g) Miscellaneous. For the operating equipment listed in 6*(d)*, describe the type and estimate the cost of repairs and maintenance expected during project operations. Do not repeat initial repairs listed in 6*(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 – No items of general overhead, corporate management, interest, taxes (other than payroll and sales taxes), or any other indirect costs, or work performed or costs incurred before the date of the contract, should be included in the estimate of costs.

7. *(a)* State whether you are prepared to furnish your share of the cost of the proposed project in accordance with the regulations on Government participation stated in Sec. 7 of DMEA Order–I, Amended.

(b) Explain to what extent you propose to furnish your share of the costs by providing money, by use of equipment owned by you, or otherwise.

* * * * *

INT.-DUP. SEC., WASH., D.C. 15539

APPLICATION FOR AID IN AN EXPLORATION PROJECT

Business organization:

Other: This project is operated as a Joint Venture by two corporations, PHELPS DODGE CORPORATION and SHASTA MINERALS & CHEMICAL COMPANY. (See attached Joint Venture Agreement.)

Officers: The following named men, employees or associates of the corporations, constitute a JOINT BOARD, that directs the operations of the Joint Venture:

WALTER C. LAWSON, Manager, Douglas, Arizona (Manager of Phelps Dodge Corporation, Douglas, Ariz.)

WILLIAM EVANS, Phoenix, Arizona, (Attorney for Phelps Dodge Corporation)

GEORGE SWANSON, Douglas, Arizona, (Auditor, Phelps Dodge Corporation, Douglas, Arizona)

KAY. L. STOKER, Salt Lake City, Utah, (President, Shasta Minerals & Chemical Corporation, Salt Lake City, Utah)

W. J. WALKER, Supervisor, Redding, California

States in which firms are organized:

Phelps Dodge Corporation - New York State

Shasta Minerals & Chemical Co - State of Nevada

OFFICIAL FILE COPY
DMEA
RECEIVED JUL 15 1957

DATE	INITIALS	CODE

Minerals for which we wish to explore:

COPPER - ZINC

Estimated cost of project:

$270,291.58

Location of property:

Sugar Loaf area, West Shasta Copper-Zinc District, Shasta County, Cal.

1. Applicants Property Rights:

Patented and unpatented mining claims situated in Sections 23, 24, 25, and 26, Township 33 North, Range 6 West, M.D.M., as follows:

LAWSON BUTTE CONS. GROUP (part): Patent No. 5597

Black Oak	Lestor	Poker
"44"	Pine Bur	Sage
Lawson Butte		

ALLEGHANY GROUP: Patent No. 5293

Alleghany Copper	Geology Copper	Roosevelt Copper
Azurite Copper	Gossan Copper	San Francisco Copper
Bornite Copper	Halite Copper	Shasta Copper
California Copper	Malachite Copper	Sulphide Copper
Chalcocite Copper	Native Copper	Slag Copper
Chalcopyrite Copper	Pennsylvania Copper	
Cuprite Copper	Pittsburg Copper	Limonite Copper
Dump Copper,	Rhyolite Copper	

COPPER MOUNTAIN CONS GROUP: Patent No. 4623

Boston Copper,	Letter	Shasta Copper
Copper Mountain	Leap Year Copper	Sugar Loaf Copper
Cuprite	Limonite	Tehama Copper
Depending	Monarch Copper	Trinity Copper
Geology Copper	Purity	
Halite	Redding Copper	

LAWSON BUTTE CONS GROUP (part): Patent No. 5595

Big Buck	Blue Jay	Dome

LAWSON BUTTE CONS GROUP (part): Patent No. 3937

Bories	Comet	Montana	Sunshine
Boston Copper	Interview	"99"	
Colorado	Marlin	Robin	
Columbia	Nascot	Sheep Spring	

GAP GROUP OF UNPATENTED MINING CLAIMS

			Am. Loc.	Recorded
Gap No. 1	5/15/56	Bk. 498, Pg. 266		
Gap No. 2	5/14/56	Bk. 498, Pg. 268		
Gap No. 3	5/15/56	Bk. 498, Pg. 270		
Gap No. 4	5/15/56	Bk. 498, Pg. 272		
Gap No. 5	5/15/56	Bk. 498, Pg. 274	12/21/56	518-96
Gap No. 6	5/16/56	Bk. 498, Pg. 276		
Gap No. 7	5/16/56	Bk. 498, Pg. 278		
Gap No. 8	5/17/56	Bk. 498, Pg. 280		
Gap No. 9	5/26/56	Bk. 498, Pg. 282		
Gap No. 10	5/28/56	Bk. 498, Pg. 284		
Gap No. 11	7/25/56	Bk. 510, Pg. 240	12/20/56	518-98
Gap No. 12	12/26/56	Bk. 518, Pg. 100		
Gap No. 13	12/19/56	Bk. 518, Pg. 102		
Gap No. 14	7/28/56	Bk. 510, Pg. 242	12/19/56	518-104

STANDARD B & P "NOTEAR" ®
STANDARD B & P "NOTEAR" ®

In the attached envelope is a property map of the district, indicating the properties held by the applicant and that part of the property subordinated under this contract.

(b) The area is generally known as the Sugar Loaf area.

(c) The applicant is a purchaser under a lease and option agreement. (See attached lease option agreement)

(d) Aside from the paramount title of the United States to the unpatented mining claims, there are no encumbrances on the property.

2. Physical Description:

(a) Attached is a property map on the scale of 1" = 500 feet, Exhibit "C", showing location of proposed drill holes and the old prospect workings. Adits "A", "C" and "D" were open, adit "E" has been opened by the applicant and adit "B" is inaccessible.

There are no production facilities on the property.

(b) All of the work done in (a) was done prior to our acquisition of the property.

(c) There has been no production from the Sugar Loaf area, the property is not now in production.

(d) There is no known ore on the property. There is a mass of pyrite exposed at the southwest end of the area on the Dump Copper claim and also along the Sugar Loaf fault where it is exposed in adit "E".

(e) Exhibit "D" is a 500 scale surface geology map, prepared from a map of the same scale in the McKinstry report. The geology is generalized and detailed mapping will doubtless modify the map a great deal.

Exhibit "E" are 500 scale sections through the proposed drill holes. The formations and structure are greatly generalized and simplified.

The structural features governing ore deposition appear to be the Sugar Loaf fault, the folds in the volcanic rocks and a preferred rock type. These features are present in the area to be explored by the project. The position of the area immediately northeast of the Iron Mountain mine and on the same trend as the ore bodies in this mine enhance the attractiveness of the project.

The ore minerals expected are pyrite, chalcopyrite and sphalerite. The ore bodies are massive pyritic replacement deposits containing variable amounts of copper and zinc. Some disseminated chalcopyrite ore has been mined in the Iron Mountain mine and similar ore may occur in this area.

STANDARD B & P "NOTEAR" ®
STANDARD B & P "NOTEAR" ®

The formations exposed in the Sugar Loaf area are the Copley, Lower Balaklala and Middle Balaklala. The Copley is the basement rock and consists of greenstone derived from andesitic and basaltic flows, agglomerates and tuffs. The Lower Balaklala consists of fine rhyolite flows with some agglomerates and tuffs and some intercalated greenstone at the base. The Middle Balaklala is the formation that contains the known ore deposits in the district and is composed principally of 1-3 mm quartz phenocryst rhyolite porphyry flows, agglomerates and tuffs, with some intercalated fine rhyolite. The distinction between the Lower Balaklala and Middle Balaklala is difficult in the Iron Mountain and adjacent Sugar Loaf areas, but the ore bodies at the Iron Mountain mine appear to be localized near the base of the Middle Balaklala. The volcanic rocks composing the Copley, Lower Balaklala and Middle Balaklala formations have been folded into a northeast trending and plunging syncline in the Sugar Loaf area. The depth to the bottom of the syncline and the dip of the limbs is not well established. Ore controls at the Iron Mountain mine are believed (by the authors of Professional Paper 285) to include existence of a feeding fissure (the Camden fault), favorable rock type and folding of the volcanics. The synclinal areas appear to be preferred. Similar features exist in the Sugar Loaf area, with the Sugar Loaf fault as the feeding fissure.

(f) The area to be explored is adjacent to and on the same trends as the Iron Mountain mine. As far as can be determined at present, the same geological conditions exist here as at the Iron Mountain mine and similar ore bodies can reasonably be expected.

(g) We enclose two copies of Professional Paper 285.

3. <u>Accessibility of the Project:</u>

(a) The Joint Venture maintains an office at Montana Street and Shasta Dam boulevard, Central Valley, California, telephone CRestwood 5-2575. W. J. Walker, local supervisor, will meet the BMM representative.

The area may best be reached by dirt road from the Iron Mountain mine. The tramway service road is followed to the divide between Boulder and Spring Creeks, then a dirt access road is followed up the ridge to the area.

(b) The shipping point is Matheson on the Shasta Dam branch of the Southern Pacific Railroad. Employees live in and adjacent to Redding and travel to and from the job each day. Transportation is furnished by the Joint Venture.

4. <u>The Exploration Project:</u>

(a) We propose to drill twenty holes in four rows of five holes each as shown on the accompanying geological and property maps (Exhibits "C", "D", and "E"). The holes will be drilled to an identifiable rock horizon, probably the Copley greenstone or a greenstone member of the Lower Balaklala. The depth of drilling necessary to explore the area is not known. On our sections we show estimated depths of drilling by rows as follows:

Row "A"	4,220 feet	(Maximum depth of 970')
Row "B"	4,720 feet	(Maximum depth of 1130')
Row "C"	4,170 feet	(Maximum depth of 1000')
Row "D"	4,330 feet	(Maximum depth of 1330')
	17,440 feet	

The proposed grid of holes, with rows spaced 1000 feet apart and holes 300 feet apart in the rows will cover an area 4,000 feet long by 1500 feet wide, which is similar to the area that includes the Iron Mountain ore bodies. If this pattern is applied to the Iron Mountain area, six of the twenty holes would encounter massive sulphide in one or the other of the ore bodies. It is possible to twist the pattern so that only one ore two holes would intercept massive sulphide ore if the pattern be applied to the Iron Mountain area. I do not believe that a looser pattern could be applied without greatly increasing the hazard of missinf substantial ore bodies. The proposed pattern might miss ore bodies aggregating several million tons because of the present spread, but should disclose the existence of sulphide masses aggregating more than 5,000,000 tons. I do not believe that a closer pattern is justified at this time.

(b) Access roads must be built to the drill sites, as indicated on the map. The exact route cannot be determined but I estimate that 20,000 feet of road will have to be built. Our experience indicates that $1.00 per foot of road is a reasonable basis for determining cost of access road construction.

(c) Work will start on the project as soon as the contract is signed, within thirty days after the signing date, unless this date is in the winter. We do not plan to work in the area during December, January, February or March because of stormy weather. A drill will average fifteen feet per drill shift or 750 feet per month on a two shift basis. With two drills, the project can be completed in two drill seasons, or two calendar years. Progress with two drills will be about 1500 feet per month.

5. Experience:

The operations of the Joint Venture are under the management of Phelps Dodge Corporation. Field supervision is presently under the direction of W. J. Walker. Mr. Walker has had twenty-one years experience in mine exploration work.

6. Estimate of Costs:

(a) Diamond drilling will be done by contract. We have completed nearly 10,000 feet of drilling in the Kalatiola and Shasta King areas to date at an average cost of about $8.75 per foot. The greatly increased average cost of deeper drilling in the Sugar Loaf area will increase this cost to about $9.50 which is used as the base in this estimate.

17,440 feet of diamond drilling. $9.50/foot $165,680

(b)	Personal Services:		
	Supervision proportion, 1/4 of $900.00/month	$ 225.00	
	Engineering proportion, 1/4 of $1250/month	312.50	
	Geologist	550.00	
	Drill Foreman	599.90	
	Samplers	2,196.80	
		3,884.20	
Item 2.	Sixteen drilling months @ $3,884.20/month		$62,147.20
(c)	Operating materials & Supplies:		
	700 core boxes @ 90¢ plus 35¢ to assemble	$ 875.00	
	Gasoline for water pump: (25 gallons per day @ 40¢, $10.00 per day for 400 days)	4,000.00	
	Oil for water pump: 200 quarts	80.00	
	Gasoline for pickup truck, $3.20 per day:	1,280.00	
	Oil for pickup truck:	96.00	
	Sample sacks, tags, etc.	250.00	
Item 3.			$6,581.00
(d)	Opprating equipment:		
	1-1/2 ton pickup truck, new, V-8 engine, 4-speed transmission, heater, 7:10x15 6-ply heavy duty tires:	$2,401.32	
	1 - type FX Gardner Denver Duplex Pump, 800# pressure, 50 gpm, complete with Waukesha gasoline engine and V-belt drive:	3,180.00	
	4,000 feet of 1" black iron pipe with victaulic couplings:	546.96	
	2,000 feet of 2" black iron pipe with victaulic couplings:	2,167.04	
Item 4.			$8,295.32
(e)	None		
(f)	New buildings, fixtures, installations:		
	Core sheds - 3 Butler steel buildings @ $600 each, plus floor at $250.00, plus hardware @ $30.00:	$2,055.00	
	Core racks for above, six @ $150.00	900.00	
	Labor to erect buildings	480.00	
		$3,435.00	

New Construction of roads to drill sites:

20,000 foot of new road @ $1.00 per foot: $20,000.00

Item 5. $23,435.00

(g) Miscellaneous:

Repairs & Maintenance:

Pickup truck:	$554.00
Gasoline pump: (water supply)	145.00
Gasoline engine for above pump:	145.00
Assaying core and sludge samples, 500 samples @ $1.50 each determination:	750.00
Accounting:	335.00
Office rent proportion:	480.00
Liability insurance:	805.12
Sales tax on new equipment:	248.86
Payroll taxes:	3,690.08

Item 6. $4,153.06

TOTAL $270,891.58

7. We are prepared to furnish our share of the cost in accordance with the regulations on government participation stated in Section 7 of DMEA order-I /amended.

(b) We intend to furnish our share of the project in money.

MF-203
(Revised July 1, 1954)

OWNER'S CONSENT TO LIEN

WHEREAS, the undersigned, as owner, co-owner, lessor, or seller has an interest in certain property in the State of CALIFORNIA, County of SHASTA, described as follows:1/

SEE ATTACHED SHEET

RECEIVED JUL 15 1957 D.M.E.A.

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

2/ SHASTA-PHELPS DODGE JOINT VENTURE

Box 857, Redding, California

hereinafter called the "Operator"; and

WHEREAS, under the provisions of said contract the Government is entitled to a percentage royalty on production and to other rights and equities which do or may conflict with or be adverse to the rights of the undersigned:

NOW THEREFORE, the undersigned, in consideration of said contract and as an inducement to the Government to enter into same, undertakes and agrees as follows:

1. The Government's equity in and right to dismantle, sever, take possession of, and remove and dispose of facilities, buildings, fixtures, equipment, or other items as provided in the contract or any amendment thereof shall prevail over and be prior and superior to any conflicting or adverse rights of the undersigned, and the Government is authorized to enter upon the land for such purposes.

2. To secure the payment to the Government of the percentage royalty on production3/ provided for under the terms of said exploration project contract or any amendment thereof there is hereby granted to the Government a lien upon the land above referred to and upon any production of minerals therefrom until said royalty is fully paid or ten years have elapsed from the date of the contract, whichever occurs first.

1/ 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 cannot be dispensed with. If the space provided is insufficient, use an Annex, and refer to the Annex in the space.

2/ Insert the name of the Operator as it will appear in the exploration project contract.

3/ Mining or production from the land is not required, and in the absence of production there is no obligation to repay the Government.

(OVER)

3. The undersigned shall commit no act nor assert any claim that may contravene or conflict with the lien, claim, or rights of the Government under the provisions of said contract. This agreement shall be binding upon the heirs, executors, administrators, successors, and assigns of the undersigned.

4. Changes and added provisions none

Dated this 3 day of July, 1957.

WALKER ENGINEERING CORPORATION [Seal]

by Woodville J. Walker [Seal]
Woodville J. Walker, President

by Belle T. Walker [Seal]
Belle T. Walker, Secretary

ORIGINAL FILE COPY
DMEA
RECEIVED MAY 14 1956
DATE | INITIALS | CODE

DECLARATION OF TRUST

KNOW ALL MEN BY THESE PRESENTS:

WHEREAS, by agreement entitled Lease and Option, dated the 1st day of July, 1956, and recorded in the Office of the County Recorder of Shasta County, California, on the 6th day of August, 1956, in Book 501, page 447, WALKER ENGINEERING CORPORATION, a Nevada corporation, did lease and option to SHASTA COPPER AND URANIUM COMPANY, INC., a Utah corporation, certain mining properties situate in the Flat Creek and Backbone Mining Districts, Shasta County, California, the same being more particularly described in Exhibit A to said Lease and Option, and

WHEREAS, by agreement entitled Joint Venture Agreement, dated the 1st day of July, 1956, said Shasta Copper and Uranium Company, Inc., and PHELPS DODGE CORPORATION entered into a joint venture to acquire the aforesaid Lease and Option dated July 1, 1956, from Walker Engineering Corporation and to explore, develop, equip, place in production and operate the mining properties covered thereby and such other properties in the West Shasta Copper Belt as delineated in Exhibit B attached to said Lease and Option as might be acquired by either party under said Joint Venture Agreement, and

WHEREAS, the corporate name of Shasta Copper and Uranium Company, Inc., was thereafter amended and changed to SHASTA MINERALS AND CHEMICAL COMPANY, INC., and said Shasta Minerals and Chemical Company, Inc., now holds said Lease and Option under and subject to the terms and provisions of said Joint Venture Agreement,

NOW, THEREFORE, Shasta Minerals & Chemical Company, Inc., does hereby declare and agree that said Lease and Option, dated July 1, 1956, from Walker Engineering Company to Shasta Copper and Uranium Company, Inc., and all rights of Shasta Minerals & Chemical Company, Inc., in and to the said Lease and Option and the properties herein described, together with any other properties acquired by or in its name in the West Shasta Copper Belt, are now and at all times shall be held by it in trust for the use and benefit of the Shasta - Phelps Dodge Joint Venture, on and subject to the terms and provisions of that certain Joint Venture Agreement dated July 1, 1956, hereinabove more particularly described.

IN WITNESS WHEREOF, Shasta Minerals & Chemical Company, Inc., has caused these presents to be executed by its proper officers thereunto authorized and its corporate seal to be hereunto affixed this 23rd day of August, 1957.

SHASTA MINERALS & CHEMICAL COMPANY, INC.

By

/S/ K. L. Stoker
President

SEAL

/S/ Nancy C. Hardman
Asst. Secretary

STATE OF UTAH)
) ss.
County of Salt Lake)

On this, the 23rd day of August, 1957, before me, Nelda Fowers, the undersigned notary

personally appeared K. L. Stoker and Nancy C. Hardman, who acknowledged themselves to be the President and assistant secretary, respectively, of SHASTA MINERALS & CHEMICAL COMPANY, INC., a corporation, and that they, as such president and assistant secretary, being authorized so to do, executed the foregoing instrument in the capacity therein stated and for the purposes therein contained.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

My commission expires January 14, 1958.

/S/ Nelda Fowers
Notary Public

SEAL

DMEA
RECORDS MANAGEMENT

AGREEMENT OF MERGER

This agreement of merger made and entered into by and between SHASTA COPPER AND URANIUM COMPANY, INC., a Utah corporation, hereinafter referred to as the "Utah corporation" and SHASTA MINERALS & CHEMICAL COMPANY, a Nevada corporation, hereinafter referred to as the "Nevada corporation", both of which corporations are hereinafter sometimes called the "Constituent Corporations" and Shasta Minerals & Chemical Company being sometimes hereinafter called the "Surviving Corporation";

WITNESSETH:

WHEREAS, the Utah corporation represents that it filed its Articles of Incorporation in the office of the County Clerk of Salt Lake County on the 22nd day of March, 1954, and filed a copy thereof, certified by said County Clerk, in the office of the Secretary of State of the State of Utah, on the 22nd day of March, 1954, and is a corporation duly organized and validly existing under the laws of the State of Utah, having an authorized capital of 6,000,000 shares of a par value of 5¢ per share of which there are issued and outstanding 3,538,000 shares, or the equivalent thereof, the said stock being its only stock and said number of shares being the total number of its authorized and issued shares, respectively; and

WHEREAS, the Nevada corporation is to be formed and its date of incorporation shall be inserted here as the 17th day of August, 1956, which corporation has been formed by the Utah corporation for the purpose of entering into this Agreement and becoming the surviving corporation, and this agreement shall be binding only if said surviving corporation is duly organized and becomes validly existing under the laws of the State of Nevada on or before the 20th day of August, 1956, having an authorized capital of $600,000.00 divided into 3,000,000 shares

of common non-assessable stock of a par value of 10¢ per share, and such shares as said corporation shall have outstanding shall be owned by the Utah corporation or its nominees; and

WHEREAS, the Utah corporation represents that to the best of its information and belief it has good and valid title, except as against the United States of America, in and to the patented and unpatented mining claims and interests in unpatented mining claims, in mineral leases, in royalties, capital stock, personal property and other property, all as more particularly set forth in Exhibit "A" annexed hereto and fully made a part hereof, subject, however, to limitations as set forth in said Exhibit "A"; and

WHEREAS, the Utah corporation represents that as of the date hereof it has cash in excess of $23,834.66 which sum is sufficient to pay and discharge all of its outstanding liabilities other than royalty interests covering mining claims and interests in mineral leases owned by the Utah corporation described in Exhibit "A", and leave a net balance of not less than $23,000.00; and

WHEREAS, the Nevada corporation will have as of the date of this Agreement, no outstanding liabilities; and

WHEREAS, the Board of Directors of each of the constituent corporations, in consideration of the mutual agreements of said corporations set forth herein, deem it advisable and generally to the welfare of said corporations and their respective stockholders that the Utah and Nevada corporations be merged, under and pursuant to the terms and conditions hereinafter set forth, the corporate existence of the Nevada corporation to be continued under and pursuant to the laws of the State of Nevada and to be governed by the Laws of the State of Nevada.

NOW, THEREFORE, each of the constituent corporations, by and between their respective Boards of Directors, in consid

ation of the premises and of the agreements, promises, covenants, grants and provisions herein contained, have agreed and do hereby agree with each other subject to the adoption of this Agreement of Merger by the respective stockholders of each of said corporations and subject to the conditions hereinafter set forth, that the Utah corporation merge itself into the Nevada corporation, and likewise that the Nevada corporation be merged into the Utah corporation pursuant to the appropriate laws and statutes of the States of Utah and Nevada, the corporate existence of the Nevada corporation to be continued under the name of Shasta Minerals & Chemical Company, and that thereafter the individual identity of the Utah corporation shall cease, and to that end, subject as aforesaid, each of the constituent corporations hereby agrees upon and prescribes the terms and conditions of said merger and of carrying the same into effect, and the manner and basis of causing the shares of each of the constituent corporations to constitute or be converted into shares of the surviving corporation are as follows:

1. The Nevada corporation hereby merges into itself the Utahcorporation, and likewise the Utah corporation shall be and is hereby merged into the Nevada corporation, which shall be the surviving corporation. The certificate of incorporation of the surviving corporation shall, on the effective date, be deemed to be the certificate of incorporation of the Nevada corporation without change.

2. The laws of the State of Nevada are the laws that shall govern the corporation.

3. The Board of Directors of the surviving corporation shall, by resolution, provide for a board of five (5) directors and until the first annual meeting of the surviving corporation after the effective date of the merger, the following shall be the directors:

DIRECTORS

Name	Address
K. L. Stoker	Salt Lake City, Utah
Harper Hunsaker	Paul, Idaho
Reed L. Reeve	Salt Lake City, Utah
Arthur Grove	Paul, Idaho
Edwin D. Hicks	Portland, Oregon

and the following shall be the officers:

OFFICERS

Name	Office	Address
K. L. Stoker	President	Salt Lake City, Utah
Harper Hunsaker	Vice-President	Paul, Idaho
Reed L. Reeve	Secretary & Treasurer	Salt Lake City, Utah

4. The mode of carrying the merger provided in the Agreement of Merger into effect and the manner and basis of converting the outstanding shares of the constituent corporations into shares of the surviving corporation shall be as follows:

Forthwith upon the filing and recording of the Agreement as required by law:

Each share of the common stock of the Utah corporation shall be converted into one-fourth (1/4) of a share of common stock of the surviving corporation, and each holder of one share of outstanding common stock of the Utah corporation shall be entitled to receive one-fourth (1/4) of a share of the common stock of the surviving corporation.

For the purposes of the foregoing "outstanding" shares shall not include shares of stock of a constituent corporation owned or held by such constituent corporation in its treasury, nor shall "outstanding" shares include shares of stock of a constituent corporation owned or held by another constituent corpor-

stion, and all such shares so owned or held by a constituent corporation on the Effective Date of the Merger and all rights in respect thereof shall on said date be and become cancelled forthwith and nothing shall be issued in exchange therefor.

No fractional shares of common stock of the surviving corporation will be issued, but in lieu thereof, each holder of a share or shares of stock of a constituent corporation entitled hereunder to receive a fraction of a share of common stock of the surviving corporation shall be entitled to receive a scrip certificate or scrip certificates exchangeable, in amounts aggregating full shares, for certificates of stock. All such scrip certificates for shares of stock shall be precluded from voting and participating in dividends or other distribution, and shall be issued in such form and on such terms and conditions, not inconsistent herewith, as may be determined by the Board of Directors of the surviving corporation. The holders of such scrip certificates shall be entitled to receive, on surrender thereof within two years after the Effective Date, together with other certificates of like tenor representing rights in respect of one or more full shares of common stock of the surviving corporation, a certificate for the number of shares of common stock of the surviving corporation equal to the number of full shares of common stock of the surviving corporation in respect of which such scrip certificates were issued. All such scrip certificates which are not surrendered within the time aforesaid shall be void and of no effect whatsoever, except that the holders thereof shall be entitled to receive their pro rata portion of the proceeds, without interest, resulting from the sale by the surviving corporation (which may be effected publicly or privately as determined by the Board of Directors at any time within six months after the expiration of said two year period) of the full shares of stock of the

surviving corporation representing such unsurrendered scrip certificates. Any proceeds resulting from such sale, not claimed within a period of two years after the date of such sale, shall be held by the surviving corporation as a part of its general funds, free of any claim of those previously entitled thereto.

The surviving corporation shall notify the holders of common stock of the Utah corporation of the place whereat, and the manner whereby, said holders may obtain certificates for such number of full shares of common stock of the surviving corporation, together with scrip certificates in respect of fractional shares of such common stock as they may be entitled to receive as herein provided.

5. When this Agreement of Merger is signed, acknowledged, filed and recorded as required by law, the separate existence of the Utah corporation shall cease and said parties and each of them shall be merged with and into the surviving corporation in accordance with the provisions of this Agreement of Merger, and in accordance with this Agreement of Merger the surviving corporation shall possess all of the rights, privileges, powers and franchises, as well of a public as of a private nature, and be subject to all of the restrictions, disabilities and duties of each of the constituent corporations, and all and singular the rights, privileges, powers and franchises of each of the constituent corporations, and all property, real, personal and mixed, and all debts due any of the constituent corporations on whatever account, as well for stock subscriptions as all other things in action, or belonging to any of the constituent corporations, shall be vested in the surviving corporation, and all property rights, privileges, powers and franchises, and all and every other interest shall be thereafter as effectually the property of the surviving corporation as they were of the constituent corporations,

and the title to any real or personal property whether by deed or otherwise, vested in any of the constituent corporations, shall not revert or be in any way impaired by reason of this Merger, provided, however, that all rights of creditors and all liens upon the property of the constituent corporations shall be preserved unimpaired, limited in lien to property affected by such liens at the time when this Agreement of Merger shall become effective, and all debts, liabilities and duties of the constituent corporations shall thenceforth attach to the surviving corporation and may be enforced against it to the same extent as if said debts, liabilities (including liabilities to dissenting shareholders of those constituent corporations which consummate the Merger contemplated hereby) and duties had been incurred or contracted by the surviving corporation.

If at any time the surviving corporation shall deem or be advised that any further assignments, assurances in law, or other acts or instruments are necessary or desirable to vest or confirm in the surviving corporation the title to any property or rights of any of the constituent corporations, the constituent corporations and their proper officers and directors shall and will execute and deliver all proper instruments and do all such acts and things as may be necessary or proper to vest or confirm title to such property in the surviving corporation, and otherwise to carry out the purposes of this Agreement of Merger, provided, however, that this sub-paragraph shall not be construed as requiring any warranty of title or the conveyance of any right, title or interest in any such property and rights except that which is owned by the constituent corporations, respectively.

6. Each of the constituent corporations, by and through its board of directors, agrees to separately hold on or before September 20th, 1956, in accordance with the applicable laws of the States of Utah and Nevada, whichever is appropriate,

a duly called special meeting of the stockholders for the purpose of considering, authorizing, adopting, ratifying and confirming this Agreement of Merger and the execution hereof, and any and all written amendments, supplements and/or modifications hereof, to give effect to the merger.

If the required votes of the stockholders of each of the constituent corporations shall be for the adoption of this Agreement, that fact shall be set forth in a certificate attached to the Agreement by the Secretary of each constituent corporation under its respective corporate seal, and the Agreement so adopted and certified shall be signed by the President and the Secretary of each constituent corporation under its respective corporate seal and acknowledged by the President of said constituent corporation to be the respective act, deed and agreement of said corporation and fully executed counterparts of this Agreement so adopted, certified, signed and acknowledged, with evidence of such adoption in the manner and form required by the laws of Utah and Nevada, shall be filed in the office of the Secretary of State of the States of Utah and Nevada.

The surviving corporation shall irrevocably appoint the Secretary of the State of Utah as the surviving corporation's agent to accept service of process, and shall specify the address therein to which a copy of such process shall be mailed by the Secretary of State, and the surviving corporation shall, within five days after the Effective Date of the Agreement of Merger, mail by ordinary mail to each stockholder of the Utah corporation a notice of the Effective Date of said Agreement of Merger.

When used herein, the term "Effective Date" shall mean the date upon which this Agreement of Merger shall be fully filed and recorded as aforesaid, and this Agreement of Merger shall be effective on the Effective Date.

Anything in this Agreement of Merger or elsewhere to the contrary notwithstanding, this Agreement of Merger and its terms shall forthwith be and become completely cancelled, terminated, abandoned, null and void and of no force and effect and this Agreement shall not be so filed and no constituent corporation shall have or be under any obligation or obligations or liability or liabilities of any kind whatsoever to any other constituent corporation or the stockholders thereof nor shall any constituent corporation or the stockholders thereof have any claim or claims of any kind whatsoever against any other constituent corporation as a result of or arising out of this Agreement if:

(a) This Agreement, except as the same may be amended as herein set forth, shall not be so filed and recorded on or before October 31, 1956; or

(b) A majority of the members of the Board of Directors of each of the constituent corporations mutually agree in writing at any time prior to the effective date of this Agreement that this agreement is cancelled and null and void and of no further force and effect; or

(c) The laws of the United States or the States of Utah or Nevada prevent the performance of this Agreement; or

(d) Any of the parties hereto are enjoined by order of any court from holding a meeting of its stockholders to consider and vote upon this Agreement of Merger; or

(e) Subsequent to the required vote of its stockholders approving and authorizing the adoption of this Agreement of Merger and prior to the filing thereof, the filing of said agreement of Merger is enjoined by any court or an order of any court enjoining the performing of any act or acts necessary to carry out and consummate this Agreement of Merger.

In the event this Agreement of Merger and its terms become so cancelled, terminated, and abandoned pursuant to the pre-

visions of sub-paragraph (c), (d) or (e) immediately hereinabove, the Secretary of the Utah corporation shall as soon as practicable give to the Secretary of the other constituent corporation, by letter or telegram, notice to that effect, but the giving of such notice shall not be a condition precedent to the cancellation, termination and abandonment of this Agreement.

In the event this Agreement of Merger becomes so cancelled, terminated or abandoned as provided in this paragraph 6, each constituent corporation shall bear its own costs and expenses incurred in connection with this Agreement of Merger.

Anything in this Agreement of Merger or elsewhere to the contrary notwithstanding, if any constituent corporation shall:

(a) Receive from the other constituent corporation before the Effective Date notice to the effect that a material adverse change in the condition, financial or otherwise, of any other constituent corporation makes the representations set forth herein incorrect, which letter or telegram shall set forth in detail the nature of such material adverse change; or

(b) Fail to obtain on or before October 1, 1956, the required vote of the stockholders for the approval and authorization and adoption of this Agreement of Merger in the manner required by law; or

(c) Be enjoined by order of any court from holding a meeting of its stockholders to consider and vote upon this Agreement of Merger; or

(d) Subsequent to the required vote of the stockholders approving, authorizing and adopting this Agreement of Merger be enjoined by order of any court from taking any action or actions or performing any act or acts necessary to carry out and consummate this Agreement of Merger; or

(e) Be prevented by laws of the United States or the

states of Utah or Nevada from performing this Agreement; or

(f) Receive on or before the Effective Date, notice from the Secretary of any constituent corporation addressed to its Secretary that the opinion of counsel to said other constituent corporation does not meet the requirements set forth in paragraph 13 hereof, which letter or telegram shall set forth in detail the manner in which said opinion of counsel does not meet said requirements; or

(g) On or prior to the Effective Date notify, pursuant to vote of a majority of the members of the Board of Directors of the constituent corporation, the Secretary of the other constituent corporation, by letter or telegram signed by its Secretary, that it cannot obtain an opinion of its counsel in the form required by the terms of paragraph 13 hereof, which letter or telegram shall set forth in detail the manner in which the opinion of its counsel cannot meet the requirements of said paragraph 13; or

(h) On or prior to the Effective Date, notify, pursuant to resolution passed by a vote of the majority of the members of its Board of Directors of the constituent corporation, the Secretary of the other constituent corporation by letter or telegram signed by its Secretary that objection in writing and written demand for payment has been duly made and filed pursuant to the applicable statute of the State of incorporation of said constituent corporation by persons, natural or corporate, together holding in the aggregate such number of shares of said constituent corporation as would in the opinion of said Board of Directors make it undesirable for said constituent corporation to proceed with the Merger;

this Agreement of Merger and these terms as to each constituent corporation shall forthwith be and become cancelled, terminated, abandoned, null and void and of no force and effect, and each constituent corporation shall have and be under no obligation or ob-

ATTORNEYS AT LAW
CONTINENTAL BANK BUILDING
SALT LAKE CITY, UTAH

ligations or liability or liabilities of any kind whatsoever to any other constituent corporation or the stockholders thereof nor shall each said constituent corporation or the stockholders thereof have any claim or claims of any kind whatsoever against any other constituent corporation arising out of or as a result of this Agreement.

In the event this Agreement of Merger becomes so cancelled, terminated, and abandoned, anything in this Agreement to the contrary notwithstanding, each such constituent corporation shall bear all costs and expenses incurred by it in connection with this Agreement of Merger and the Merger.

7. The surviving corporation hereby agrees that it may be served with process in the State of Utah in any proceeding for the enforcement of any obligations of the Utah corporation as well as for the enforcement of any obligations of the surviving corporation arising from the merger, and the surviving corporation hereby irrevocably appoints the Secretary of State of the State of Utah as its agent to accept service of process in any such suit or other proceedings.

8. Except as otherwise in this Agreement provided, the consolidated corporation shall pay all expenses of the Merger.

9. This Agreement has been duly approved and authorized by resolution of the Board of Directors at each of the constituent corporations at duly called meetings thereof, at which quorums were present.

10. The constituent corporations reserve the right to amend, alter, repeal or make additions to any provision contained in this Agreement in the manner now or hereafter prescribed by the statutes and laws of the Statesof Utah or Nevada and all rights conferred on officers, directors and stockholders herein are granted subject to this reservation.

11. Each of the constituent corporations represent that from and after the date hereof until and including October 31, 1956, or the Effective Date, if any, whichever is earlier, it will perform any and all work and do any and all things necessary to preserve the title which it hereinabove represents it has in and to the patented and unpatented mining claims, interests in mining claims, in mineral leases, in royalties, in capital stock, in personal property and other property, all as more particularly described in the respective Exhibits hereto.

12. Each of the constituent corporations agrees to deliver to each other, upon demand, a balance sheet prepared by certified public accountants, which balance sheet said corporation represents will show that its financial condition is as represented hereinabove in the preamble to this Agreement. Each of the constituent corporations further represents that between the date of this Agreement and October 31, 1956, or the Effective Date, if any, whichever occurs earlier, it will not:

(a) Incur any liabilities of any kind whatsoever except for routine items in the ordinary course of its business operations;

(b) Authorize any increase in the capital stock, or issue any capital stock;

(c) Permit the payment of any dividends or allow any distributions to be made to its stockholders;

(d) Do anything whatsoever which will in any way result in its financial condition being worse than its financial condition as evidenced by said balance sheet to be delivered as hereinabove provided;

(e) Do anything or perform any act whatsoever which will in any way adversely affect the title and interest which it hereinabove represents it presently has in any and all unpatented and patented mining claims, mineral leases, royalties, corporate stock,

personal property and other property more particularly described in the appropriate one of the Exhibits hereto.

13. On the Effective Date hereof each of the constituent corporations will cause to be delivered to each of the other constituent corporations an opinion of its counsel stating that as of the close of business on the day immediately preceding the Effective Date:

(a) Said constituent corporation at that time was a corporation duly organized, validly existing and in good standing under the laws of the States of Utah and Nevada, whichever is appropriate.

(b) There are outstanding and there are issued the numbers of shares of its capital stock hereinabove represented, each of which shares is fully paid and non-assessable.

(c) There are no outstanding options to acquire in any manner any shares of its capital stock or its property; and

(d) All necessary steps were duly effected by said constituent corporation in accordance with all requirements of the statutes and laws of the United States and of the States of Utah and Nevada, whichever is appropriate, in connection with this Agreement of Merger and the Merger contemplated hereby and said constituent corporation has duly and validly approved, adopted and delivered this Agreement and this Agreement constitutes the valid and binding obligation of said constituent corporation and said constituent corporation is duly and validly authorized and empowered to consummate this Merger;

and covering such other matters as any of the constituent corporations may reasonably request.

14. The representations as to title contained in the preamble to this Agreement shall not survive the Effective Date, if any, and the executed original counterparts of this Agreement required to be filed and recorded as set forth in paragraph 6

hereof shall not have appended thereto Exhibit "A".

15. For the convenience of the parties hereto and to facilitate the filing and recording of this Agreement, any number of counterparts hereof may be executed and each such counterpart shall be deemed to be an original instrument.

16. This Agreement and its terms shall be binding upon and inure to the benefit of each of the constituent corporations and their respective successors.

IN WITNESS WHEREOF, each of the parties to this Agreement pursuant to authority duly given by resolution of its respective Boards of Directors, has caused these presents to be executed by at least a majority of its directors, and its corporate seal affixed, as to Shasta Copper and Uranium Company, Inc., a Utah corporation, on the 15th day of August, 1956, and as to Shasta Minerals & Chemical Company, a Nevada corporation, on the 18th day of August, 1956.

SHASTA COPPER AND URANIUM COMPANY, INC., a Utah corporation

By /S/ K. L. Stoker
President

/S/ K. L. Stoker

/S/ Reed L. Reeve

/S/ Harper Hunsaker

/S/ Arthur Grove

/S/ Edwin D. Hicks

A Majority of the Board of Directors

ATTEST:

/S/S Reed L. Reeve
Secretary

SHASTA MINERALS & CHEMICAL COMPANY, a Nevada corporation

By /S/ D. Howe Moffat
President

/S/ O. Webster Adams

/S/ K. Jay Holdsworth

/S/ D. Howe Moffat

ATTEST:

/S/K. Jay Holdsworth
Secretary

A Majority of the Board of Directors

STATE OF UTAH)
: SS
COUNTY OF SALT LAKE)

On the 15th day of August, 1956, personally appeared before me K. L. Stoker, who being by me duly sworn, did say that he is the President of Shasta Copper and Uranium Company, Inc., a Utah corporation, and that said instrument was signed in behalf of said corporation by resolution of its Board of Directors, and said K. L. Stoker acknowledged to me that said corporation executed the same.

Ruth McKinson
Notary Public
Residing at Salt Lake City, Utah

My commission expires:
September 1, 1959

STATE OF Utah)
: SS
COUNTY OF Salt Lake)

On the 18th day of August, 1956, personally appeared before me D. Howe Moffat, who being by me duly sworn did say that he is the President of Shasta Minerals & Chemical Company, a Nevada corporation and that said instrument was signed in behalf of said corporation by resolution of its Board of Directors, and said D. Howe Moffat acknowledged to me that said corporation executed the same.

/S/ Ruth McKinson
Notary Public
Residing at Salt Lake City, Utah

My commission expires:
September 1, 1959

STATE OF UTAH)
: SS
COUNTY OF SALT LAKE)

On this 15th day of August, 1956, personally appeared before me Ruth McKinson, a Notary Public in and for Salt Lake County, K. L. Stoker known to me to be the President of Shasta Copper and Uranium Company, Inc., a Utah corporation, and upon oath did depose that he is the officer of said corporation as above designated; that he is acquainted with the seal of said corporation and that the seal affixed to said instrument is the corporate seal of said corporation; that the signatures to said instrument were made by the officers of said corporation as indicated after said signatures; and that said corporation executed the said instrument freely and voluntarily and for the uses and purposes therein mentioned.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal at my office in the county of Salt Lake the date and year in this certificate first above written.

/S/ Ruth McKinson
Notary Public
Residing at Salt Lake City, Utah

My commission expires:
September 1, 1959

STATE OF Utah)
: SS
COUNTY OF Salt Lake)

On the 18th day of August, 1956, personally appeared before me, Ruth McKinson, a Notary Public in and for the Salt Lake County D. Howe Moffat known to me to be the President of Shasta Minerals & Chemical Company, a Nevada corporation, and upon oath did depose that he is the officer of said corporation as above designated; that he is acquainted with the seal of said corporation and that the seal affixed to said instrument is the corporate seal of said corporation; that the signatures to said instrument were made by officers of said corporation as indicated after said signatures; and that the said corporation executed the said instrument freely and voluntarily for the uses and purposes therein mentioned.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal at my office in the County of Salt Lake the day and year in this certificate first above written.

/S/ Ruth McKinson
Notary Public
Residing at Salt Lake City, Utah

My commission expires:
September 1, 1959

I, K. JAY HOLDSWORTH, Secretary of Shasta Minerals & Chemical Company, a corporation organized and existing under the laws of the State of Nevada, hereby certify, as such Secretary and under the seal of the said corporation, that the Agreement of Merger to which this Certificate is attached, after having been first duly signed on behalf of said corporation by a majority of the directors of Shasta Minerals & Chemical Company, a Nevada corporation, and Shasta Copper and Uranium Company, Inc., a Utah corporation, was duly submitted to the stockholders of said Shasta Minerals & Chemical Company, a Nevada corporation, at a special meeting of said stockholders called and held on September 15th, 1956, separately from the meeting of stockholders of any other corporation, upon waiver of notice, signed by all the stockholders, for the purpose of considering and taking action upon said Agreement of Merger, that One Thousand (1,000) shares of stock of said corporation were on said date issued and outstanding and that the holders of One Thousand (1,000) shares voted by ballot in favor of the approval of said proposed Agreement of Merger and the holders of No (0) shares voted by ballot against same, the said affirmative vote representing at least a majority of the total number of shares of the issued and outstanding capital stock of said corporation, and that thereby the Agreement of Merger was at said meeting duly adopted as the act of the stockholders of said Shasta Minerals & Chemical Company and the duly adopted Agreement of the said corporation.

WITNESS, my hand and the seal of said Shasta Minerals & Chemical Company on this 15th day of September, 1956.

/S/ K. Jay Holdsworth
Secretary

The undersigned, Secretary of Shasta Copper & Uranium Company, Inc., one of the corporations described in and party to the foregoing Agreement of Merger, hereby certifies that the Agreement was submitted to the stockholders of the corporation at a meeting thereof called separately from meetings of the stockholders of the other corporation which is a party to said Agreement for the purpose of taking the foregoing Agreement of Merger into consideration and duly called and held on the 15th day of September, 1956, and that due notice of the time, place and object of the meeting was given by publication for at least thirty (30) days prior thereto in a newspaper published in the County of Salt Lake, State of Utah, in which County said corporation has its principal place of business; and a copy of such notice was duly mailed to the last known post office address of each stockholder of said Corporation at least thirty (30) days prior to the date of such meeting; that at the said meeting the Agreement was considered and a vote by ballot in person or by proxy was duly taken for the adoption or the rejection of the same, each share having one vote, and that the votes of stockholders of said Corporation representing more than a majority in the amount of the outstanding stock entitled to vote were for the adoption of the Agreement.

WITNESS, my hand and the seal of Shasta Copper and Uranium Company, Inc., this 15 day of September, 1956.

/S/ Reed L. Reeve
Secretary of Shasta Copper and Uranium Company, Inc.

(SEAL)

THE ABOVE AGREEMENT OF MERGER having been approved by resolution of the respective Boards of Directors of Shasta Minerals & Chemical Company, a Nevada corporation, and Shasta Copper and Uranium Company, Inc., a Utah corporation, and having been signed and executed by each of said corporations and by at least a majority of the directors of each of said corporations and thereafter having been duly adopted and approved by the respective stockholders of the above named corporations at meetings separately called and held, by the affirmative vote of the holders of a majority of the voting power of the respective shareholders in the manner prescribed by the General Corporate Laws of the State of Nevada; Title 16 of the Utah Code, and that fact having been certified on said agreement of merger by the Secretary of each of said corporations, the President and Secretary of each of said corporations do now hereby execute said Agreement of Merger under the corporate seal of their respective corporations by authority of the directors and shareholders, as the respective act, deed and agreement of each of said corporations this 15 day of September, 1956.

SHASTA MINERALS & CHEMICAL COMPANY

/S/ By D. Howe Moffat
President

(SEAL)

/S/ K. Jay Holdsworth
Secretary

SHASTA COPPER AND URANIUM COMPANY, INC.

By /S/ K. L. Stoker
President

(SEAL)

/S/ Reed L. Reeve
Secretary

STATE OF UTAH)
: SS
COUNTY OF SALT LAKE)

On this 15th day of September, 1956, personally appeared before me, Ruth Atkinson, a Notary Public in and for Salt Lake County, K. L. STEKER, known to me to be the president of Shasta Copper and Uranium Company, Inc., a Utah corporation, and upon oath did depose that he is the officer of said corporation as above designated; that he is acquainted with the seal of said corporation and that the seal affixed to said instrument is the corporate seal of said corporation; that the signatures to said instrument were made by the officers of said corporation as indicated after said signatures; and that said corporation executed the said instrument freely and voluntarily and for the uses and purposes therein mentioned.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal at my office in the county of Salt Lake the date and year in this certificate first above written.

/S/ Ruth McKinson
Notary Public
Residing at Salt Lake City, Utah

My commission expires:

9-1-59

STATE OF UTAH)
: SS
COUNTY OF SALT LAKE)

On the 15th day of September, 1956, personally appeared before me, Ruth Atkinson, a Notary Public in and for Salt Lake County, D. HOWE MOFFAT, known to me to be the President of Shasta Minerals & Chemical Company, a Nevada corporation, and upon oath did depose that he is the officer of said corporation as above designated; that he is acquainted with the seal of said corporation and that the seal affixed to said instrument is the corporate seal of said corporation; that the signatures to said instrument were made by officers of said corporation as indicated after said signatures; and that the said corporation executed the said instrument freely and voluntarily for the uses and purposes therein mentioned.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal at my office in the County of Salt Lake the day and year in this certificate first above written.

/S/ Ruth McKinson
Notary Public
Residing at Salt Lake City, Utah

My commission expires:

9-1-59

EXHIBIT "A"

Properties of Shasta Copper and Uranium Company, Inc.

1. Certain Lease and Option Agreement between Walker Engineering Company, a corporation, and Shasta Copper and Uranium Company, Inc., bearing date July 1, 1956. Said Lease and Option has been recorded in Book 105, page 447, of the books and records of the County Recorder of Shasta County, California.

2. Joint Venture Agreement between Shasta Copper and Uranium Company, Inc., and Phelps-Dodge Corporation bearing date July 1, 1956, concerning the exploration, development and mining of the properties covered by the Lease and Option referred to in paragraph 1 hereof.

3. Twenty Three Thousand Eight Hundred Fifty-Four and 66/100 Dollars ($23,854.66) cash.

HAROLD P. FABIAN
BEVERLY S. CLENDENIN
D. HOWE MOFFAT
RENDELL N. MABEY
PETER W. BILLINGS
SANFORD M. STODDARD

ALBERT J. COLTON
O. WEBSTER ADAMS, JR.
K. JAY HOLDSWORTH

FABIAN, CLENDENIN, MOFFAT & MABEY
ATTORNEYS AND COUNSELORS AT LAW
CONTINENTAL BANK BUILDING
SALT LAKE CITY 1, UTAH

August 13, 1956

Mr. K. L. Stoker
% Shasta Copper & Uranium Co.
Dooly Building
Salt Lake City, Utah

Dear Mr. Stoker:

We enclose herewith original Lease and Option between Walker Engineering Corporation, a Nevada corporation, and Shasta Copper and Uranium Company, Inc., a Utah corporation. The Lease and Option was filed in the Office of the County Recorder of Shasta County, Redding, California.

Very truly yours,

D. Howe Moffat

D. HOWE MOFFAT

DHM:lw

Enclosure

7730

LEASE AND OPTION

THIS LEASE AND OPTION, made and entered into as of the First day of July, 1956, by and between WALKER ENGINEERING CORPORATION, a Nevada corporation, hereinafter called "Walker", and SHASTA COPPER AND URANIUM COMPANY, INC., a Utah corporation, hereinafter called "Shasta",

W I T N E S S E T H:

WHEREAS, Walker is the owner of several groups of patented and unpatented lode and placer mining claims and other tracts of land, more particularly described in Exhibit A hereto attached, and being hereinafter referred to as "the Mining Properties", and

WHEREAS, the Mining Properties are situated in that certain area in the Flat Creek and Backbone Mining Districts, Shasta County, California, known and herein designated as "the West Shasta Copper Belt", and being shown as such on Exhibit B hereto attached, and

WHEREAS, Walker made and entered into a Mining Lease and Option covering said lode and placer mining claims and other tracts of land with K. L. Stoker, a resident of Salt Lake City, Utah, which said Mining Lease and Option was dated January 18, 1954, and

WHEREAS, the interest of said K. L. Stoker in said Mining Lease and Option was, on or about the 2nd day of April, 1954, duly assigned to Shasta, and

WHEREAS, said Mining Lease and Option was amended by Agreement to Amend Mining Lease and Option dated October 20, 1954, and by Amendment to Agreement to Amend Mining Lease and Option dated November 21, 1955, both of said amendatory agreements having been executed as of such dates by Walker and Shasta, and

WHEREAS, said Mining Lease and Option and said amendatory agreements are hereinafter referred to as the "Original Lease", and

WHEREAS, subject to the provisions of paragraph XXII of this Lease and Option, Walker and Shasta desire to cancel the Original Lease as of July 1, 1956, and to enter into this Lease

and Option,

NOW, THEREFORE, in consideration of the premises and the mutual covenants and agreements hereinafter contained, and the sum of Ten Dollars ($10.00) in hand paid by each party to the other, the receipt whereof is hereby acknowledged, the parties do hereby agree as follows:

I. LEASE OF MINING PROPERTIES. Walker does hereby lease to Shasta all properties now owned by Walker and located in the West Shasta Copper Belt, specifically including the Mining Properties as described in Exhibit A hereto attached, together with all unpatented mining claims which may be located in the name of Walker (and not purchased or otherwise acquired from others) in the West Shasta Copper Belt during the term of this Lease and Option as provided in paragraph IX hereof.

II. TERM OF LEASE AND OPTION. The term of this Lease and Option shall be for the period commencing July 1, 1956, and ending May 31, 2053, unless sooner terminated as herein provided.

III. RIGHTS OF SHASTA. During the term of this Lease and Option Shasta shall have the right to conduct exploratory, drilling, mining and metallurgical operations on the Mining Properties; to extract, produce, remove, process, ship and sell or otherwise dispose of ores, minerals and mineral products; to cut, use, sell and dispose of timber thereon or to sell standing timber, and to permit others to cut and remove the same; to excavate, remove, dump and dispose of rock, tailings and other waste materials; and otherwise to use the Mining Properties for any lawful purpose and to develop, produce, use, remove, exploit and sell the natural resources thereof. The rights of Shasta shall be subject to existing contracts for removal of timber and scrap iron, and for grazing, and to the drilling contract as set forth in paragraph XV hereof, but all proceeds otherwise receivable by Walker under said contracts from timber, scrap iron and grazing rentals shall be assigned and paid to Shasta and shall be considered as gross income from the Mining Properties, subject to the provisions of paragraph VII hereof.

IV. ROYALTIES.

(a) Royalties on Production, etc. Shasta shall pay to Walker a royalty equal to two and one-half per cent (2½%) of the gross income received during the term of this Lease and Option by Shasta from the Mining Properties, including, but not limited to, proceeds from the sale of ore, concentrates, timber and scrap iron (but only scrap iron now located on the Mining Properties) and from grazing fees and other land rentals, which said royalty shall be determined as follows:

(i) Ore and Concentrates Sold to Custom Smelters. In the case of ores and concentrates shipped and sold by Shasta to a custom smelter, (it being understood that the term "custom smelter" shall include a custom electrolytic zinc plant) the royalty shall be based upon the net smelter returns for the same. The term "net smelter returns" shall mean the net amount paid by such custom smelter for the ore or concentrates, after deduction of custom smelting costs, charges and penalties, including, but not limited to, metal losses, penalties for impurities, refining, and freight from smelter to refinery and from refinery to market, and after deduction of all costs of transporting the ores and concentrates from the Mining Properties to the custom smelter (irrespective of whether such transportation costs shall have been paid or incurred by Shasta or the custom smelter in the first instance).

(ii) Ore and Concentrates Processed by Custom Smelters on a Toll Basis. In the case of ores and concentrates shipped by Shasta to a custom smelter for processing on a toll basis, with the metals or other products being returned to Shasta, such ores or concentrates shall be deemed to have been sold to and purchased by such smelter, and the royalty shall be based on the net smelter returns therefor, as defined in subparagraph (a)(i) hereof and as nearly as the same can be reasonably ascertained, which would have been received by Shasta if such ores and concen-

trates had in fact been sold to and purchased by such custom smelter.

(iii) Ore and Concentrates Smelted by Shasta, etc. It is understood and agreed that ores and concentrates may be shipped to a smelter owned or controlled by Shasta or an assignee of any interest of Shasta in this Lease and Option. The ores and concentrates shipped to such smelter shall be weighed, sampled and assayed at such smelter in accordance with standard custom smelting methods, and Walker shall have the same rights and privileges of checking and verifying the accuracy of such weighing, sampling and assaying methods and results as are customarily afforded the vendors of ores and concentrates by a custom smelter. Such ores or concentrates shall be deemed to have been sold to and purchased by such smelter, and royalties thereon shall be based on the net smelter returns therefor as defined in subparagraph (a)(i) hereof, which net smelter returns shall be established in such manner as will be not less than the most favorable net smelter returns, as nearly as the same can reasonably be ascertained, which could have been obtained under contract from an available custom smelter for shipment and sale to it during the same period of time of ores and concentrates from the Mining Properties of like character and quantities.

(iv) Intermediate Processing of Ore. Should any ore from the Mining Properties be delivered for processing to a mill or treatment plant, whether owned or operated in whole or in part by Shasta, any subsidiary or assignee of Shasta, the ore delivered to such mill or treatment plant shall be kept separate from ore from other Mining properties, and the mill products therefrom shall be kept separate from the mill products from other properties, and Walker's royalties shall be based on the net smelter returns on the concentrates therefrom subject to

smelter deductions and transportation costs from the mill or treatment plant to the smelter, as provided in paragraph IV (a)(i) but not subject to milling costs or profits or to transportation costs from the Mining Properties to the mill or treatment plant.

(v) Sales to Acid Plants. If any sales of ore, concentrates or other products be made to an acid plant or to any purchaser other than a custom smelter or custom mill, the royalty therefrom shall be based upon the amount paid by the purchaser for such ore or concentrates in the form in which shipped and sold, after deducting any charges reasonably made by such purchaser and costs of transporting said ore or concentrates from the shipment point to such purchaser.

(vi) Timber and Rentals. Royalties on the sale of timber and from land rentals shall be based on the gross proceeds realized by Shasta from such transactions.

(vii) Payment of Royalties. Royalties on ore or concentrates sold to a custom smelter or other purchaser shall be deducted from the net smelter returns or the net amount to be paid for the same, and shall be remitted directly to Walker, together with a copy of each settlement sheet. Royalties on ore or concentrates shipped to a custom smelter for processing on a toll basis shall be paid to Walker by the time the same would have been paid if such ore or concentrates had been sold to such custom smelter. Royalties on ore shipped to a smelter owned or controlled by Shasta or an assignee of any interest of Shasta in this Lease and Option, shall be paid to Walker not later than the 25th day of the second calendar month following the calendar month in which such ore or concentrates are received at such smelter. Royalties on gross proceeds from other sources, such as from timber sales and land rentals, shall be paid to Walker not later

than the 25th day of the calendar month following the calendar month in which such proceeds are received by Shasta.

(b) Minimum Royalty. The minimum royalty payable by Shasta to Walker under the provisions hereof shall be as follows:

(i) For the period commencing July 1, 1956, and ending December 31, 1956, the minimum royalty shall be Twelve Thousand Five Hundred Dollars ($12,500.00), less the amount of Five Thousand Dollars ($5,000.00), or less the amount of five per cent (5%) of the gross expenditures made during the entire calendar year of 1956 (including those made under the Original Lease) for exploration, development and mining of the Mining Properties (including the cost of engineering, geological, geophysical and metallurgical testing work properly applicable thereto) and for the installation of permanent equipment, buildings and facilities for the mining of said properties, whichever of said amounts of reduction is the smaller.

(ii) The minimum royalty for the annual period commencing January 1, 1957, and for each annual period thereafter during the term of this Lease and Option shall be Twenty-five Thousand Dollars ($25,000.00) less the amount of Ten Thousand Dollars ($10,000.00), or less the amount of ten per cent (10%) of the gross expenditures made during such calendar year for the exploration, development and mining of the Mining Properties (including the cost of engineering, geological, geophysical and metallurgical testing work properly applicable thereto) and for the installation of permanent equipment, buildings and facilities for the mining of said properties, whichever of said amounts of reduction is the smaller.

(iii) In the event the gross expenditures referred to in subparagraph (i) above made during the entire calendar year of 1956 exceed the amount of One Hundred

Thousand Dollars ($100,000.00), or the gross expenditures referred to in subparagraph (ii) above made during the calendar year 1957, or during any calendar year thereafter, exceed the amount of One Hundred Thousand Dollars ($100,000.00), then, for the purpose of computing minimum royalties hereunder, the amount of such excess shall be carried forward to the succeeding calendar year and shall be considered as the first money expended during such succeeding calendar year, but any such excess may not be carried forward to more than the three (3) calendar years immediately following the calendar year in which such excess expenditure was actually made.

(iv) The minimum royalty for any calendar year shall be paid to Walker not later than the last day of February following the close of such calendar year; it being understood and agreed that all royalties on gross income from the Mining Properties paid to Walker during such calendar year shall be credited and applied against the minimum royalty otherwise payable to Walker for such calendar year.

(e) Shasta not Obligated to Produce. It is fully understood and agreed that Shasta shall not be obligated or required to carry on any activities or operations which will produce gross income subject to royalties, and if the amount of the royalties payable by Shasta on gross income during any calendar year is less than the minimum royalties herein provided for such year, Shasta shall be obligated only for the difference as herein provided. Nothing in this subparagraph shall affect Shasta's obligation to make the expenditures provided in paragraph V hereof.

V. MINIMUM EXPENDITURES. During the period commencing July 1, 1956, and ending December 31, 1957, Shasta shall expend not less than One Hundred Fifty Thousand Dollars ($150,000.00) for or in direct connection with the exploration, development and mining of the Mining Properties (excluding general overhead and general administrative expenses), and the installation of permanent

equipment, buildings and facilities thereon, and for ad valorem taxes on the Mining Properties, and the costs of locating and performing assessment work on unpatented mining claims comprising the Mining Properties, or for any of said purposes.

VI. WARRANTIES OF TITLE. Walker represents and warrants that it is the owner and holder of good and merchantable title to the Mining Properties, free and clear of all liens, charges and encumbrances, subject only to the provisions of this Lease and Option, obligations for repayment of existing D.M.E.A. loans, ad valorem taxes for the year 1956 and subsequent years, reservations and exceptions contained in the original United States patents, and in the case of unpatented mining claims to all conflicts with patented mining claims and with prior valid unpatented mining claims, and the paramount title of the United States, and to existing contracts for removal of timber, scrap iron and for grazing and to all existing rights of way and easements. Walker represents and warrants that it has full power and authority to enter into this Lease and Option and to convey the Mining Properties in accordance with the terms hereof.

VII. REPAYMENT OF LOANS MADE BY SHASTA TO WALKER. Shasta has made loans or advances to Walker under the provisions of the Original Lease for which there remains a balance of Fifteen Thousand Three Hundred Eighty-eight and 88/100 Dollars ($15,388.88) which has not been repaid. Shasta shall credit against said balance all proceeds hereafter received by Shasta from the sale of timber from the Mining Properties, and the proceeds so credited shall not be subject to royalties otherwise payable to Walker. If at any time royalties are payable to Walker on proceeds from the sale of ore or concentrates and the full amount of said balance has not been discharged by proceeds from timber sales, there shall be credited against the then remaining balance one-half (1/2) of the royalties otherwise payable to Walker on proceeds from the sale of ore or concentrates until such balance has been discharged in full and the amount to be paid to Walker as such royalties (but not the minimum royalty) shall be reduced by the amount so credited.

In the event this Lease and Option shall be cancelled for any reason, the obligation of Walker to repay Shasta the then balance of said loans or advances shall survive and be payable by Walker out of one-half (1/2) of any net income received by Walker from the Mining Properties, or in the event of sale thereof, out of the net proceeds of such sale. Such obligation to repay shall continue so long as Shasta exists as a legal entity, but in no event for more than ten (10) years after cancellation of this Lease and Option.

VIII. OPTION FOR PURCHASE OF THE PROPERTIES. If and when during the term of this Lease and Option Walker shall have been paid, either as royalties or additional payments as herein provided, or both, an aggregate amount equal to the value of 10,000,000 pounds of copper at the price per pound for electrolytic copper, domestic refinery, as quoted in the "E & M J Metal and Mineral Markets" as of the respective dates upon which any such royalties or additional payments shall have been paid, then Walker shall convey the Mining Properties to Shasta by good and sufficient deeds of conveyance, and this Lease and Option shall forthwith cease and terminate, and Shasta shall not be liable for the further payment to Walker of any royalties hereunder. It is fully understood and agreed that Shasta, at its option, may at any time, or from time to time, make payments to Walker in addition to the royalties becoming due and payable hereunder, which additional payments shall be applied and credited, in the manner herein provided, against the value of said 10,000,000 pounds of copper. For the purpose of this paragraph, each amount paid to Walker as royalties or additional payments hereunder shall be divided by the said price per pound of copper so quoted for the date upon which such amount was paid to Walker, and the resulting equivalent in pounds of copper shall apply against the total pounds of copper aforesaid. It is expressly agreed that the purpose of settling in this manner is to provide against the possibility of inflation or deflation of the dollar.

IX. SHASTA ACQUIRING ADJACENT PROPERTIES. It is fully

understood and agreed that Shasta may acquire from others through purchase, lease or otherwise, any mining claims or properties, in addition to the Mining Properties as described in Exhibit A, and Walker shall have no right, title or interest therein, either in the nature of royalty rights or otherwise. It is understood and agreed, however, that any unpatented lode or placer mining claims in the West Shasta Copper Belt validly located furing the term of this Lease and Option by or on behalf of Walker, and not purchased, leased or otherwise acquired from others, shall be located in the name of Walker and shall become the property of Walker subject to the terms and provisions of this Lease and Option the same as if originally described herein, but Walker shall not locate any such mining claims during the term of this Lease and Option without the prior written consent of Shasta first had and obtained, provided that if Shasta refuses to consent to any such locations by Walker, Walker shall have the right to make such locations without any expense to Shasta, and claims so located shall not be subject to the terms of this Lease and Option.

X. ENCUMBRANCES. Shasta agrees to keep the Mining Properties free and clear of liens and encumbrances for labor performed or materials furnished to Shasta for use on the Mining Properties during the term of this Lease and Option. Shasta shall post and maintain on the Mining Properties during the term of this Lease and Option and record the same in the office of the County Recorder, Shasta County, California, in accordance with the applicable statutes of the State of California, a notice in substantially the form attached hereto as Exhibit C. It is further understood and agreed that neither of the parties shall do any act which shall cause the Mining Properties to become subject to any liens or encumbrances other than liens for taxes pending payment thereof by Shasta in accordance with the provisions of paragraph XI hereof; provided, however, that Shasta may apply for and obtain D. M. E. A. loans from the appropriate United States Government lending agency similar to the existing D. M. E. A. loans and that Walker shall execute with the lending agency such

loan agreements as may be necessary to enable Shasta to obtain or secure any such loans, and that the provisions for repayment of such loans shall not be deemed encumbrances within the meaning of this paragraph.

XI. TAXES. Shasta shall pay before the same become delinquent all ad valorem taxes levied and assessed against the Mining Properties and becoming due and payable during the term of this Lease and Option, together with any and all license, excise and production taxes arising or resulting from the operations of Shasta hereunder; it being understood, however, that Shasta may contest the amount and validity of any such taxes, and in such event shall not be obligated or required to pay the same until the amount and validity thereof has been finally determined.

XII. ASSESSMENT WORK. Shasta agrees to perform, at its own expense, all necessary annual assessment work on or for the benefit of the unpatented mining claims included in the Mining Properties for the assessment year ending July 1, 1957, and for each assessment year thereafter in which this Lease and Option shall not have been cancelled and terminated prior to June 1st of such assessment year, and shall record proof of labor therefor.

XIII. SALE OF ORE AND COMMINGLING OF PRODUCTS. All ore and concentrates shipped from the Mining Properties to a custom smelter shall be shipped to that custom smelter which, in the judgment of Shasta,(such judgment to be reasonably made and to take into consideration the interest of Walker) offers the most favorable net smelter returns, after taking into consideration the cost of transportation. Without the written consent of Walker first had and obtained, Shasta shall not mix or commingle ore, concentrates, dumps, tailings or other products of the Mining Properties with other ore, concentrates, dumps, tailings or other products from other mining properties during mining, milling, treatment, transportation or shipment thereof by Shasta.

XIV. COMPLIANCE WITH LAWS AND RIGHT OF INSPECTION. Shasta shall comply with all federal and state laws applicable to operations conducted by it on the Mining Properties. Walker or its

agents or designees shall have the right at all reasonable times to inspect the Mining Properties together with all maps, records and books pertaining thereto, including production, shipments and gross income therefrom.

IV. EXISTING DRILLING CONTRACT. Walker has entered into a drilling contract with MacPherson Drilling Company, dated September ____, 1955, and two contracts for the sale of timber with W. S. Price, dated September 30, 1955 and March 30, 1956, respectively, as amended and supplemented, which contracts have not yet been completed. Shasta agrees to assume all of the obligations, financial and otherwise, of Walker under said contracts.

VII. LITIGATION. In the event of any litigation concerning any of the Mining Properties or the operations under this Lease and Option, involving any third person whomsoever, the parties agree to cooperate in the disposition and handling of such litigation. The cost of any such litigation which bears directly upon or arises out of such operations or the titles to the Mining Properties shall be borne by Shasta, except where such litigation is caused solely by any act or omission of Walker. In the event either party to this Lease and Option obtains a judgment against the other party arising out of this Lease and Option, or the provisions hereof, the judgment creditor shall not levy any execution upon the interest of the judgment debtor in the Mining Properties until the expiration of five (5) years from the date such judgment becomes final.

VIII. SHASTA OPTION TO CANCEL. Shasta shall have the right to cancel and surrender this Lease and Option at any time then and after December 31, 1957, by giving Walker at least thirty (30) days' previous notice in writing, stating therein the date as of which such cancellation is to be effective, and upon satisfaction by Shasta of all its obligations arising

hereunder to the date of such cancellation, this Lease and Option shall be terminated and of no further force or effect, except for the provisions of paragraphs VII and XIX hereof. In the event of any such cancellation, the minimum royalty herein provided to be paid for the calendar year in which such cancellation occurs shall be pro-rated to the date of cancellation, and Shasta shall be obligated only for that portion of such minimum royalty as is represented by the portion of the calendar year expired to the date of cancellation. In the event of such cancellation, Shasta agrees to execute and deliver to Walker a quitclaim deed to the Mining Properties, subject, however, to Shasta's rights under paragraphs VII and XIX hereof.

XVIII. WALKER'S RIGHT TO CANCEL. In the event Shasta shall default in any obligation or covenant contained or provided herein as and when the performance thereof becomes due, and such default shall continue for a period of sixty (60) days, Walker may give notice to Shasta of such default and unless the same is remedied within twenty (20) days following receipt by Shasta of such notice, Walker may thereupon cancel and terminate this Lease and Option, except for the provisions of paragraph VII hereof. In the event of such cancellation, Shasta agrees to execute and deliver to Walker a quitclaim deed to the Mining Properties, subject, however, to the rights of Shasta under paragraph VII hereof.

XIX. REMOVAL OF BUILDINGS AND EQUIPMENT AND DELIVERY OF FACTUAL DATA. Upon cancellation or termination of this Lease and Option, Shasta shall, within six (6) months from the date of such cancellation, remove all machinery, equipment and facilities which can be removed without substantial damage to the Mining Properties or the permanent equipment, buildings and facilities thereon (unless such damage can be and is repaired by Shasta promptly following such removal), but shall

leave all buildings and surface and underground fixtures which cannot be so removed, and all rail, pipe, mine timbers and underground supports which have been installed and are in place. Anything not so removed within said six (6) months may not thereafter be removed without the written consent of Walker. Upon the termination of this Lease and Option for any cause, Shasta shall give to Walker originals or copies of all factual data with regard to said property, including all maps, reports, etc.

XI. NOTICES. Any notice or payment herein provided to be given or paid by Shasta to Walker shall be deemed so given or paid upon delivery thereof to Walker's office at 612 Dooly Building, Salt Lake City, Utah, or, if mailed, upon deposit thereof in a United States post office, registered mail, postage prepaid, addressed to Walker at such address. Any such payment may be made in the form of check, draft or money order, subject to being honored upon presentation. Any notice herein provided to be given by Walker to Shasta shall be deemed given to Shasta upon delivery thereof to Shasta's office at 612 Dooly Building, Salt Lake City, Utah, or, if mailed, upon deposit thereof in a United States post office, registered mail, postage prepaid, addressed to Shasta at such address. The address and location of either party to which notices or payments shall be so delivered or mailed may be changed by either party upon giving written notice to the other of such change, stating in such notice the new location and address.

XII. SHASTA-PHELPS DODGE JOINT VENTURE. Except as hereinafter provided, neither party may assign or transfer its rights in, to or under this Lease and Option or the Mining Properties without the prior written consent of the other first had and obtained. It is understood and agreed, however, that Shasta may enter into a joint venture agreement with Phelps Dodge Corporation, a New York corporation, with respect to this

Lease and Option, and in such event all interests, rights and privileges and duties and liabilities of Shasta under this Lease and Option shall inure to the benefit of and become the obligations of the joint venture (including the parties to the joint venture agreement) and to any new corporation formed pursuant to the joint venture agreement, and Shasta may transfer, assign and convey to Phelps Dodge Corporation or to the joint venture, and the parties to said joint venture agreement, or either of them, may assign, transfer and convey to such new corporation the interests, rights and privileges of Shasta in, to and under this Lease and Option in accordance with the provisions of the joint venture agreement, provided that no such assignment to any such new corporation shall be made prior to January 1, 1958, or prior to the expenditure by Shasta of the minimum expenditure referred to and provided for in paragraph V hereof, whichever occurs first, and that such corporation shall not have any right of further assignment without the written consent of Walker being first had and obtained. The parties to said joint venture agreement, so long as the same shall be in force and effect, and the said new corporation, upon assignment of this Lease and Option to it, shall assume and be bound by the covenants and obligations, and shall be entitled to the rights and privileges of Shasta hereunder, in accordance with the provisions of the joint venture agreement.

XXII. <u>OPERATION AND EFFECT</u>. It is fully understood and agreed that this Lease and Option shall be of no force or effect whatsoever, and the rights, duties, powers and privileges of the parties shall be the same as though this agreement had not been executed, unless Shasta on or before August 15, 1956, shall have entered into the joint venture agreement with Phelps Dodge

Corporation relating hereto, said agreement to be in accordance with paragraph XXI of this agreement, in which event this Lease and Option shall be deemed to have become effective as of July 1, 1956, and shall cancel and supersede the Original Lease effective as of said date. It is further understood and agreed that one of the purposes of this Lease and Option is to eliminate all references contained in the Original Lease to the Agreement dated the 16th day of January, 1954, between Kay L. Stoker and Walker, and the Agreement dated the 20th day of October, 1954, between Shasta and Walker. The terms, covenants and conditions of the aforementioned agreements shall be deemed excluded from this Lease and Option and shall not, in any respect, apply to the Mining Properties or affect the rights and obligations of the parties under this Lease and Option. Said agreements dated the 16th day of January, 1954, and the 20th day of October, 1954, shall be and the same hereby are amended to eliminate therefrom any reference to the Mining Properties and in such other respects as may be necessary fully to carry out and effectuate the purpose expressed in this paragraph XXII.

XXIII. SUCCESSION. The provisions of this Lease and Option shall be binding upon and inure to the benefit of the parties hereto, their successors and assigns.

IN WITNESS WHEREOF, the parties to this Lease and Option have caused the same to be executed by their respective proper officers thereunto duly authorized, and their corporate seals to be hereunto affixed, as of the date first herein written.

WALKER ENGINEERING CORPORATION

By R. T. Walker
Its President

Attest: Betty T. Walker
Its Secretary

SHASTA COPPER AND URANIUM COMPANY, INC.

By K. L. Stoker
Its President

Attest: Joseph Keene
Its Secretary

STATE OF UTAH
COUNTY OF SALT LAKE } ss.

On this 14th day of July, A. D. 1956, before me, a Notary Public in and for the said County and State, residing therein, duly commissioned and sworn, personally appeared R. T. WALKER and BELLE T. WALKER, known to me to be the President and Secretary respectively of Walker Engineering Corporation, the corporation that executed the within instrument, and duly 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 first above written.

George M. McMillan
Notary Public
Residing at Salt Lake City, Utah

My Commission expires:
9/15/57

STATE OF UTAH
COUNTY OF SALT LAKE } ss.

On this 18th day of July, A. D. 1956, before me, a Notary Public in and for the said County and State, residing therein, duly commissioned and sworn, personally appeared I. L. STOKER and REED L. REEVE, known to me to be the President and Secretary respectively of Shasta Copper and Uranium Company, Inc., the corporation that executed the within instrument, and duly 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 first above written.

Ruth M. Atkinson
Notary Public
Residing at Salt Lake City, Utah

My Commission expires:
9-1-59

EXHIBIT "A"

Properties covered by Mining Lease & Option dated January 18th, 1954

Lot No.	Description	Acres.	Mount Diablo Base & Meridian Section	Township.	Range
4107	Statesman Group (11 claims) Patented 11-19-04, recorded in Vol. 9 of Patents, Pg. 36 - 53	183.77	1 12	33 N "	6 W "
	Congressman claim Democrat " Judge " Mugwump " Politician " President " Prohibitionist " Republican " Senator " Socialist " Statesman "				
3839	Shasta King Cons. Group (6 claims) Patented 8-15-02, recorded in Vol. 7 of Patents, Pg. 188 - 193	117.51	1 11 12	33 N " "	6 W " "
	Addenda Claim Grand View " Last Chance " Lookout " Shasta King " Sunny Side "				
3840	Lost Desert Cons.Group (6 claims) Patented 2-3-03, recorded in Vol. 7 of Patents, Pg. 207 - 211.	116.40	1 12	33 N "	6 W "
	Anything Claim Golden Age " June Bug " Lost Desert " Protection " Tar Flat "				
3905	Sulphide Cons.Group (6 claims) Patented 7-21-04, recorded in Vol. 7 of Patents, Pg. 330 -334.	105.10	1 12	33 N "	6 W "
	Chaparral Claim Copper " Oxide " Rosebud " Sulphide " Yellow Jacket "				

Lot No.	Description	Acres.	Mount Diablo Base & Meridian Section	Township	Range
3937	Thirteen Claims out of the Lawson Butte Cons. Group Patented 9-8-06; recorded in Vol. 11 of Patents, pg. 79 - 91 Bories claim Boston Copper " Colorado " Columbia " Comet " Interview " Marlin " Mascot " Montana " "99" " Robin " Sheep Spring " Sunshine "	258.41	23 24 25	33 N " "	6 W " "
5597	Seven Claims out of the Lawson Butte Cons. Group. Patented 6-4-23; recorded in Vol. 14 of Patents, Pg. 440 - 444. Black Oak Claim "44" " Lawson Butte " Lester " Pine Bur " Poker " Sage "	138.051	24 25	33 N "	6 W "
5595	Three Claims out of the Lawson Butte Cons. Group. Patented 6-4-23; recorded in Vol. 14 of Patents, Pg. 445 - 448. Big Buck Claim Blue Jay " Dome "	55.154	23 24	33 N "	6 W "
5569	Kit Cons. Group (5 claims) Patented 6-4-23; recorded in Vol. of Patents, Pg. B. Ans. Claim Edythe " Helen " Kit " Marg. "	76.476	6 7 1 12	33 N " " "	5 W " 6 W "

Lot No.	Description	Acres.	Mount Diablo Base & Meridian Section	Township	Range
5293	Allegheny Group (22 Claims) Patented ; recorded in Vol. of Patents; Pg.	396.519	22 23 26 27	33 N " " "	6 W " " "
	Allegheny Copper Claim Allehcny Dump " Extention Azurite Copper " Bornite " California " Chalcocite " Chalcopyrite " Cuprite Copper " Dump " Geology " Gossan " Halite Copper " Malachite " Native " Pennsylvania Copper " Pittsburg Copper " Rhyolite " Roosevelt Copper " San Francisco Copper " Shasta Copper " Sulphide " Slag "				
4623	Copper Mountain Cons. Group (17 Claims) Patented ; recorded in Vol. of Patents, Pg.	300.00	25 26	33 N "	6 W "
	Boston Claim Copper Mountain " Cuprite " Depending " Geology " Halite " Letter " Leap Year " Limonite " Monarch " Mountain Copper " Purity " Redding " Shasta " Sugar Loaf " Tehama " Trinity "				
4148	Great Verde Group (4 claims) Patented 5-10-06; recorded in Vol. 11 of Patents; pg. [illegible]	72.[illegible]	11 12	33 N "	6 W "
	Blue Vein Claim Copper Bank Great Verde Red Copper				

Lot No.	Description	Acres.	Mount Diablo Base and Meridian Section	Township.	Range
4754	Holcomb Group (2 claims) Patented 3-21-10; recorded in Vol. 11 of Patents; Pg. 382. Dump Claim Holcomb "	22.73	11	33 N	6 W
4502	Cocktail Claim (7/9 interest) Patented 5-4-07; recorded in Vol. of Patents; Pg.	4.77	12	33 N	6 W
	Ridge Placer Mining Claim Patented 3-1-02; recorded in Vol. 7 of Patents; pg. 139 - 140 S 1/2 of S 1/2 of NE 1/4 of Sec. 29 S 1/2 of SE 1/4 of NW 1/4 of Sec. 29 (Less that portion of the above conveyed to Wm. Candrick by deed dated 6-22-02, recorded in Vol. 73 of Deeds, Pg. 210).	40.	29	33 N	6 W
	Motion Creek Placer Mining Claim Patented 3-1-02; recorded in Vol. 7 of Patents; Pg. 137 - 138. N. 1/2 of SW 1/4 of Sec. 29 NW 1/4 of SE 1/4 of Sec. 29. (Less that portion conveyed to Anna McLaughlin by deed dated 5-5-03, recorded in Vol. 79 of Deeds, Pg. 29).	95.	29	33 N	5 W
	United Placer Mining claim Patented 3-1-02; recorded in Vol. 7 of Patents; Pg. 134 - 135. S 1/2 of SW 1/4 of Sec. 29. SW 1/4 of SE 1/4 of Sec. 29. (Less that portion conveyed to Mary J. Lanyon by deed dated 6-2-02, recorded in Vol. 98 of Deeds, Pg. 103)	108.	29	33 N	5 W
	River Placer Mining Claim Patented ; recorded in Vol. of Patents; Pg. N 1/2 of NE 1/4 of SE 1/4 N 1/2 of E 1/2 of NE 1/4 of SE 1/4 (Less 43.6 acres of the above four placers, sold 7-2-46 to the Bureau of Reclamation.)	20.	29	33 N	5 W
	Two Lots in the Mamata Copper Belt, Flat Creek Mining District, Shasta County, California:				
	Township 34 North, Range 6 West Section 36. SW 1/4 N 1/2 less 40 acres deeded to V. Lowden and 20 acres deeded to Di Hola. NW 1/2 of NW 1/4 of SE 1/4.	440.	36	34 N	6 W

Fee Lands in the Shasta Copper Belt, Flat Creek Mining District, Shasta County, Calif. (Cont'd):

Description	Acres	Mount Diablo. Base & Meridian Section	Township	Range
Township 33 North, Range 5 West Section 8. S 1/2 of NE 1/4 W 1/2 of NW 1/4 S 1/2 (less 185 acres, sold 5-13-46, to the Bureau of Reclamation, as follows:	480.	8	33 N	5 W

Parcel 1. All that part of the S 1/2 of the NE 1/4 and S 1/2 of Section 8 lying on the easterly side of the line which follows the natural surface of the ground at an elevation of 1100 ft. above sea-level, hereinafter re-reffed to as the 1100 ft. contour, through said Section 8 from a point in the west boundary of the E 1/2 of Section 8 on the southerly side of Squaw Creek, southerly to a point in the south boundary of Section 8, containing 179 acres.

Parcel 2. All that part of the W 1/2 of NW 1/4 of Section 8, lying on the northerly side of the 1100 ft. contour line, on the southerly side of Squaw Creek, containing 6 acres.

Unpatented Mining Claims in the Shasta Copper Belt, Shasta County, Calif.

Flat Creek Mining District.

Lot No.	Description.	Acres	Mount Diablo. Base & Meridian Section	Township	Range
4784	Skookum Cons. Group (6 claims) Surveyed for patent, but not patented.	109.94	11	33 N	6 W
	Hard Cash Claim				
	Hi Yu "				
	Last Dollar "				
	Mountain Creek "				
	Skookum "				
	Yellow Pyrite "				
4813	Potlatch Cons. Group (2 claims) Surveyed for patent, but not patented.	40.40	1	33 N	6 W
			2	"	"
			11	"	"
			12	"	"
	Potlatch Claim				
	R. B. Cooper "				

Backbone Mining District

Unpatented lode mining claims, situated in Section 1, Township 33 North, Range 6 West, and in Section 6, Township 33 North, Range 5 West, M.D.B. & M.

Name of the Lode Claim	Recorded 1942	Official Book	Records Page
Midway No. 1 mining claim	Sept. 29	85	394
Midway No. 2 " "	" 29	85	395
Midway No. 3 " "	" 29	85	396
Midway No. 4 " "	" 29	85	397
Midway No. 5 " "	" 29	85	398
Midway No. 6 " "	" 29	85	399
Midway No. 7 " "	" 29	85	400
Midway No. 8 " "	" 29	85	401
Midway No. 10 " "	" 29	85	403

Backbone Mining District (Cont'd)

Unpatented Lode Mining claims, situated in Section 1, Township 33 North, Range 6 West, and in Section 6, Township 33 North, Range 5 West, M.D. B.& M.

Name of the Lode Claim	Recorded 1942	Official Book	Records Page
**Midway No. 9 mining claim	Sept. 29	85	402
Midway No. 13 " "	Oct. 7	"	408
Midway No. 14 " "	" 7	85	406
Midway No. 15 " "	" 13	85	410
Midway No. 16 " "	" 7	85	407
Midway No. 17 " "	" 13	85	411
Midway No. 18 " "	" 14	85	413
Midway No. 19 " "	" 7	85	405
Midway No. 20 " "	" 14	85	414
Midway No. 21 " "	" 14	85	415
Midway No. 22 " "	" 13	85	412

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Balaklala Mining Properties

Lot No.	Description	Acres.	Section	Township	Range
3446	Balaklala Group (11 claims)		7	33 N	5 W
	patented 5/18/01, recorded in		11	33 N	6 W
	Book 7 of Patents, Page 107 -		12	"	"
	Balaklala claim		13	"	"
	Fortune "		14	"	"
	Alice "				
	Huckleberry "				
	El Capitan "				
	El Monte "				
	Mule "				
	Dump "				
	Feldspar "				
	Windy Camp "				
	Cleveland "				
4143	Copper Alps Group (17 claims)		10	33 N	6 W
	patented 3/1/05, recorded in		11	"	"
	Book 9 of Patents, Pg. 261		14	"	"
	Normandie claim		15	"	"
	Himalaya "				
	Wintun "				
	Black Metal "				
	Omega "				
	Early Bird "				
	Seaver "				
	Oro Blanco "				
	Butte "				
	Copper Alps "				
	Dewey "				
	New Eldorado "				
	Grand Prize "				
	South Fork "				
	Hobson "				
	Western "				
	Sampson "				
4145	Blenheim Group, (13 claims)		12	33 N	6W
	patented 4/3/05, recorded in		13	"	"
	Book 9 of Patents, Pg. 298		14	"	"
	Blaine claim				
	Bryan "				
	Jefferson "				
	Snow Slide "				
	Triangle "				
	Babe in the Woods				
	Alta "				
	Hill "				
	Cold Feet "				
	Chincapin "				
	Blenheim "				
	Last Choice "				
	Cold Stream "				
4225	Good Hope Claim, patented 4/19/05, recorded in Book 9 of Patents, page 327.		12	33 N	6 W

Lot No.	Description	Acres	Section	Township	Range
4226	Good Medicine Claim patented 4/19/05 recorded Book 9 of Patents, Pg. 322		12	33 N	6 W
4146	Cold Water Claim patented 3/1/05, recorded in Book 9 of patents, Pg. 256		14	33 N	6 W
4144	McKinley Group (19 claims) patented 7/28/05, recorded book 9 of Patents, Pg. 456		12	33 N	6 W
			13	"	"
			7	33 N	5 W
	McKenzie		8	"	"
	Frozen North		17	"	"
	Copley		18	"	"
	Spring Gulch				
	Pony				
	Ruby				
	Jasper				
	Big Chief				
	Blue Jay				
	Sunny South				
	Cold Spring				
	Trail				
	Iron Cap				
	McKinley				
	Garnet				
	Rain Crow				
	Lucky Boy				
	White Grouse				
	Emma Star				
4502	Cocktail Claim (2/9 int) patented May 4, 1907, Recorded Book 11 of Patents, Page 166		12	33 N	6 W
4501	Rocky Gulch Group (2 claims) patented 4/27/08, recorded book 11, page 240.				
	- Rocky Gulch				
	- Creek				
4599	Indiana Group (4 claims) patented 4/27/08, recorded book 11 of patents, page 243.		19	33 N	5 W
			20	"	"
			29	"	"
	Indiana		30	"	"
	Last Chance				
	Sunrise				
	Bay State				
4244	1/3 Int. in Sheridan Group, patented 4/03/05, recorded in book 9 of Patents, Page 421 (3 claims)		14	33 N	6 W
	Phil Sheridan				
	US Grant				
	W T Sherman				
4807	Hillside Claim, patented 2/24/13 recorded book 12 of Patents, Pg. 602		12	33 N	6 W

Unpatented lode claims located in the West Shasta Copper Belt subsequent to January 18th, 1954:

EMPIRE GROUP - Sections 10, 11, T33N R6W MDM, Shasta County, California

Name	District	Locator	Loc.Date	Rec.Date	Bk.	Pge.
Empire No. 1	Flat Creek	Walker Eng. Co.	8/25/55	11/22/55	477	86
" No. 2	"	"	8/26/55	11/22/55	477	88
" No. 3	"	"	8/27/55	11/22/55	477	90
" No. 4	"	"	2/10/56	3/22/56	488	61
" No. 5	"	"	2/10/56	3/22/56	488	63
" No. 6	"	"	2/14/56	3/22/56	488	65
" No. 7	"	"	2/16/56	3/22/56	488	67
" No. 8	"	"	2/20/56	3/22/56	488	69
" No. 9	"	"	2/20/56	3/22/56	488	71
" No. 10	"	"	3/15/56	3/22/56	488	73
" No. 11	"	"	3/18/56	3/22/56	488	75

GAP GROUP - Sections 23 & 24, T 33 N, R 6 W, MDM, Shasta County, California

There have been fourteen claims located in this group, principally during May and June, 1956. The location work has been done on 1 through 10, inclusive, but not on 11 through 14, inclusive. The locations have not yet been recorded so we do not have the data on them.

EXHIBIT C TO LEASE AND OPTION

NOTICE

"Pursuant to the California Code of Civil Procedure, Section 1192, notice is hereby given that Walker Engineering Corporation is the owner of the following described properties (insert here a description of the Mining Properties) and that said corporation does hereby give notice that it will not be responsible for any construction, alteration or repairs upon any of said property for any work performed or labor done or materials furnished on said property, and that said property is subject to a certain Lease and Option between said Walker Engineering Corporation and Shasta Copper and Uranium Company, Inc., dated as of the ____ day of _____, 1956, and recorded in the office of the County Recorder, Shasta County, California as of the _____ day of _____, 1956, and that said property will not be subject to any liens as a result of the operations of said Shasta Copper and Uranium Company, Inc. or any assignee thereof."

RECORDED AT REQUEST OF
Fabian, Clendenin, Moffat & Mabey
AT 35 MIN. PAST 9A M
OFFICIAL RECORDS SHASTA COUNTY, CALIF.
AUG 6 1956
Volume 501-Page 447
Mildred Montgomery
RECORDER FEE $ 21.40 pd.

Shasta Minerals and Chemical Company
612 Dooly Building
Salt Lake City 1, Utah

Gentlemen:

In accordance with Clause 11 of the Joint Venture Agreement dated July 1, 1956, it is mutually agreed that we shall each contribute $125,000.00 to the Joint Venture for the period ending December 31, 1957, making a total of $250,000.00 which shall be in addition to and in excess of the amount specified for said period in the Joint Venture Agreement.

It is understood that if the parties shall determine at any time that the full amount of the additional contribution will not be required for the year 1957, the same may be reduced by action of the parties, and each of us shall then be liable to contribute only our share of the reduced amount. It is further understood that payment of our respective shares of the additional contribution shall be made by each of us at such time or times as the Joint Board shall prescribe, and that any amounts so paid and not expended during the year 1957 shall be credited against contributions for the subsequent year or years. If Phelps Dodge Corporation shall withdraw from the venture at the end of 1957 as provided by the agreement, any unexpended part of the additional contribution as provided by this letter, shall be distributed to the parties as their interest may appear.

If the foregoing is in accordance with your understanding, please indicate by signing and returning the enclosed copy of this letter.

Yours very truly,

PHELPS DODGE CORPORATION

By [signature]
Its General Manager

Approved and Accepted:

SHASTA MINERALS & CHEMICAL COMPANY

By [signature]
Its

Dated: December 21, 1956
[signature] Dec 24, 1956

JOINT VENTURE AGREEMENT

THIS AGREEMENT, entered into as of the 1st day of July, 1956, by and between SHASTA COPPER AND URANIUM COMPANY, INC., a Utah corporation, herein referred to as "Shasta", and PHELPS DODGE CORPORATION, a New York corporation, herein referred to as "Phelps Dodge",

W I T N E S S E T H :

The parties mutually agree to enter into a joint venture on and subject to the terms and conditions as follows:

ARTICLE 1. Definition of Terms. As used in this Agreement, the following words and phrases shall be deemed to have the meanings set forth below:

(a) Walker. The Walker Engineering Corporation (formerly known and referred to as "Walker Corporation"), a corporation organized and existing under the laws of the State of Nevada.

(b) Original Lease. That certain Mining Lease and Option dated January 18, 1954, from Walker to K. L. Stoker, covering patented lode and placer mining claims and other tracts in the West Shasta Copper Belt, as amended by Agreement to Amend Mining Lease and Option dated October 20, 1954, and as further amended by Amendment to Agreement to Amend Mining Lease and Option dated November 21, 1955.

(c) New Lease. The new lease and option agreement entered into by Shasta with Walker as of July 1, 1956, which shall cancel and take the place of the Original Lease from and after July 1, 1956.

(d) West Shasta Copper Belt. That certain area within the Flat Creek and Backbone Mining Districts, Shasta County, California, as designated and shown on the map attached as Exhibit B to the New Lease.

(e) Walker Properties. All patented and unpatented mining claims and other tracts of land in the West Shasta Copper Belt owned by Walker, specifically including those described in the Original Lease, the property referred to in the Original Lease as the Malakiala property, and any patented or unpatented mining claims located or acquired by Walker or Shasta subsequent to January 18, 1954, and prior to the date of the New Lease, and any patented or unpatented mining claims located by Walker, or by either of the parties hereto in the name of Walker, pursuant to the provisions of the New Lease.

(f) Outside Property or Properties. Any properties in the West Shasta Copper Belt other than the Walker properties.

(g) D. M. E. A. Loans. Funds loaned or to be loaned to either of the parties hereto by the United States through the Defense Minerals Exploration Administration, or its successor agency, for exploration of the Walker properties.

(h) Joint Venture. The joint venture to be entered into by the parties pursuant to this Agreement, and which shall be known as the "Shasta - Phelps Dodge Joint Venture".

(i) Contributions. The amounts in this Agreement provided to be paid by the respective parties toward the costs and expenditures of the Joint Venture.

(j) Prior Expenditures. The net amount paid by Shasta to Walker under paragraphs V and VI of the Original Lease and actually expended by Walker prior to July 1, 1956, for acquisition, preservation and exploration of the Walker properties,

after deducting any amounts realized by or for the credit of Shasta prior to such date from timber sales and from D. M. E. A. loans, but it being understood that such net amount shall not exceed Eighty Thousand Dollars ($80,000.00).

(k) Prior Credits. Any amounts realized by Shasta subsequent to July 1, 1956, from D. M. E. A. loans in reimbursement of the prior expenditures, together with any credits or receivables from Walker on account of the prior expenditures.

(l) New Corporation. The corporation to be organized pursuant to CLAUSE 18 hereof.

(m) Joint Board. The board of five members provided for in CLAUSE 6 hereof to consist of three (3) nominees of Phelps Dodge and two (2) nominees of Shasta.

CLAUSE 2. Negotiation of New Lease. Concurrently with execution of this Agreement, Shasta has executed and entered into the New Lease in form approved by Phelps Dodge. The New Lease, together with the Prior Credits, shall be and become the property of the Joint Venture. Promptly following execution of this Agreement Shasta shall execute and deliver to Phelps Dodge appropriate assignments and declarations of trust, in form approved by Phelps Dodge and suitable for recording, covering all rights of Phelps Dodge in and to the New Lease under the terms of this Agreement. Shasta shall not enter into any agreements amending or varying the terms of the New Lease without prior written approval of Phelps Dodge.

CLAUSE 3. Period of Joint Venture. The Joint Venture shall commence as of July 1, 1956, and unless sooner terminated by reason of Phelps Dodge's withdrawal pursuant to CLAUSE 9 hereof, shall continue until organization of the New Corpora-

tion and transfer to it of the New Lease and all other assets of the Joint Venture.

ARTICLE 4. Purpose of Joint Venture. The purpose of the Joint Venture shall be to acquire the New Lease and to explore, develop, equip, place in production and operate the Walker Properties and such of the outside properties as may be acquired by the Joint Venture under the provisions of this Agreement, including installation of such plants and facilities for production and beneficiation of ores and other products from the properties of the Joint Venture as may be deemed economically justified.

ARTICLE 5. Management of Joint Venture. The Joint Venture, and all exploration, development, construction and production operations to be conducted hereunder shall (subject to approval by the Joint Board to the extent hereinafter provided) be under the management and control of Phelps Dodge, particularly including, without limiting the generality of the foregoing, the following:

(a) The receipt, deposit, custody, control and expenditure of the funds of the Joint Venture.

(b) The determination, selection, acquisition, installation, use and operation by the Joint Venture of geological, geophysical, drilling, exploratory, development, mining, production, metallurgical treatment, marketing and accounting methods, procedures, facilities, tools, supplies, equipment, machinery and improvements, and the selection, employment and use of consultants, geologists, geophysicists, supervisors, engineers, accountants, employees and other personnel.

ARTICLE 6. Joint Board. The Joint Board shall con-

sist of five (5) members, three (3) of whom shall be appointed by and serve as representatives of Phelps Dodge, and two (2) of whom shall be appointed by and serve as representatives of Anaconda, and a decision by a majority of the members of the Joint Board on any matter provided in this Agreement to be determined by the Joint Board shall be controlling on the parties hereto. On or before August 5, 1953, each of the parties shall notify the other in writing of its respective appointees to the Joint Board, and at any time, or from time to time thereafter, each such party may replace any or all of its appointees to the Joint Board by notifying the other in writing of the appointee or appointees to be replaced and the name or names of the new appointee or appointees.

Not later than August 10, 1953, and from time to time thereafter, Phelps Dodge shall designate a member of the Joint Board to act as chairman, who shall call and preside over all meetings of the Joint Board and shall perform such other functions as the Joint Board shall authorize. The first meeting shall be called and held on or before August 15, 1953, and regular annual meetings shall be called and held on the third Monday in October of each year. Special meetings of the Joint Board may be called by the chairman at any time. The chairman shall dispatch written notice, by United States mail or telegram to each member not less than five (5) days prior to the date of the meeting, stating therein the time and place for the meeting. Members of the Joint Board shall receive no compensation for their services as such members, but shall be reimbursed by the Joint Venture for their actual travel costs and expenses in attending meetings of the Joint Board.

SECTION 2. Functions of Joint Board. The functions of

the Joint Board shall consist primarily of the following:

(a) At the meeting to be held on or before August 15, 1956, to approve and adopt a general operating program, and an overall budget of expenditures for the Joint Venture for the period commencing July 1, 1956, and ending December 31, 1957, and at each annual meeting to approve and adopt such program and budget for the ensuing calendar year.

(b) At special meetings to make such changes in the operating program and budget as may be considered necessary or required.

(c) At the first meeting to be held on or before August 15, 1956, to fix the date or dates for payment of the contributions to be made by the parties for the period commencing July 1, 1956, and ending December 31, 1957, and at the regular meeting to be held in 1957 and in each year thereafter to fix and determine, within the limits in CLAUSE 8(c) of this Agreement provided, the contributions to be made by the parties to the Joint Venture for the succeeding calendar year, and the date or dates during such calendar year for payment of such contributions.

(d) To authorize and approve any D. M. E. A. loans, and the terms and conditions thereof, for the benefit of the Joint Venture, it being understood that the Joint Venture will assume existing D. M. E. A. loans, and, subject to approval by the Joint Board of the exploratory programs and other terms and conditions involved thereunder, the Joint Venture will accept further advances under existing D. M. E. A. loan commitments and will prosecute pending and future applications for such loans.

CLAUSE 8. Contributions. It is contemplated that

each of the parties will contribute funds in equal amounts for the purpose of the Joint Venture as follows:

(a) For the period commencing July 1, 1956, and ending December 31, 1957, Phelps Dodge shall contribute an amount equal to the prior expenditures, plus the further amount of Fifty Thousand Dollars ($50,000.00). As expeditiously as reasonably possible, Shasta shall furnish Phelps Dodge with a full and complete statement showing the prior expenditures, and Phelps Dodge shall be given access to Shasta's books, records and accounts, including statements and accounts furnished by Walker, in order to verify the prior expenditures. If Phelps Dodge does not verify, to its satisfaction, any item of the prior expenditures as furnished by Shasta, the parties will endeavor to adjust the same, failing in which the propriety and amount of such item to be included as a prior expenditure shall be submitted to arbitration as provided in CLAUSE 21 hereof.

(b) Shasta's contribution for the period commencing July 1, 1956, and ending December 31, 1957, shall consist of a credit in the amount of the prior expenditures, in addition to which Shasta shall contribute the further amount of Fifty Thousand Dollars ($50,000.00).

(c) For the calendar year 1958 and for each calendar year thereafter to and including the calendar year 1961, each of the parties shall contribute like amounts, as determined by the Joint Board at the annual meeting preceding such calendar year, but not less than Fifty Thousand Dollars ($50,000.00) nor more than One Hundred Twenty-Five Thousand Dollars ($125,000.00) by each party for each such year.

CLAUSE 9. Further Not to Make Contributions. Not later than the first day of December, 1957, or the like day of

each calendar year thereafter, either party may elect not to make its contribution for the succeeding calendar year by giving notice in writing to the other party of such election. In case Phelps Dodge shall elect not to make its contribution, the Joint Venture shall terminate as of the close of the calendar year in which it notifies Shasta of such election, and Phelps Dodge shall thereupon relinquish, release and assign to Shasta all of its interest in the Joint Venture, including the New Lease and any other assets or properties owned and held by or on behalf of the Joint Venture. In case Shasta shall elect not to make its contribution to the Joint Venture for any calendar year, or shall fail to make payment of such contribution at or prior to the time or times fixed by the Joint Board for the making thereof, Shasta shall not thereafter be entitled to make such contribution or such payment, including any payments thereafter becoming due and payable on account of Shasta's contribution for such year, and Phelps Dodge, at its election, may proceed with the expenditures up to the full amount as budgeted for such calendar year, making up by additional contribution of its own the deficiency resulting from Shasta's failure to make its contribution or payments, or Phelps Dodge may limit the expenditures for such year to the amounts available exclusive of Shasta's contribution or defaulted payments thereon.

CLAUSE 10. Payment and Deposit of Contributions. Contributions to be made by Shasta shall be paid to Phelps Dodge at the time or times and in the amounts determined by the Joint Board as herein provided, and shall be deposited by Phelps Dodge, along with contributions required or permitted to be made by Phelps Dodge hereunder and any other funds available to the

Joint Venture, into a special account in the name of the Joint Venture, with such bank as Phelps Dodge may designate, and shall be subject to withdrawal and expenditure by Phelps Dodge for the purposes of the Joint Venture. Contributions of Shasta shall be deemed paid upon receipt thereof by Phelps Dodge in the form of check, draft or money order, but only if honored on presentation.

CLAUSE 11. Increased Contributions. The parties may mutually agree to make contributions to the Joint Venture in excess of those specified to be made hereunder, to be paid and expended at such time, for such purposes, and in such manner as the parties shall mutually agree.

CLAUSE 12. Expenditures. Phelps Dodge shall expend the full amount of the contributions made for the period commencing July 1, 1956, and ending December 31, 1957, and for each calendar year thereafter, in the period or calendar year for which such contributions are made, and shall also expend the proceeds of D. M. E. A. loans and any other funds available to the Joint Venture, substantially in accordance with and for the purposes set forth in the budgets approved, adopted and amended from time to time by the Joint Board. In this respect, it is fully understood and agreed that said budgets shall specify the general purpose for which the funds of the Joint Venture are to be expended, but that within the approximate limits prescribed for each general purpose Phelps Dodge shall have and exercise full discretion as to the details of the expenditures to be made for each such purpose. It is further understood and agreed that the funds available to the Joint Venture shall, amongst other things, be expended by Phelps Dodge for the main-

tenance of insurance coverage against liabilities arising from or in connection with the operations of the Joint Venture, payment of excise, ad valorem and similar taxes on operations and property of the Joint Venture, and performance of obligations under the New Lease, including payment of minimum royalties.

ARTICLE 11. Statements of Account. Phelps Dodge shall submit to the Joint Board at each regular meeting, detailed statements and reports of all expenditures made and contemplated to be made during the calendar year in which such meeting is held. As promptly as is reasonably possible following the close of each calendar year Phelps Dodge shall cause to be prepared and filed on behalf of the Joint Venture federal and state income tax information returns covering such calendar year, and shall furnish to the members of the Joint Board detailed statements of expenditures and charges made for or to the Joint Venture during such calendar year.

ARTICLE 12. Access to Operations and Records. Phelps Dodge shall permit Shasta's appointees to the Joint Board, and such reasonable number of agents and employees as they or either of them may designate in writing, to have access at all reasonable times (a) to all properties and operations of the Joint Venture, subject to such reasonable safety regulations as Phelps Dodge may impose; (b) to all factual data, records and reports compiled or obtained by Phelps Dodge at the cost and expense of the Joint Venture, but not including confidential communications, evaluations or interpretations made by and between executive officers of Phelps Dodge with respect to such factual data, records or reports; and (c) to all books, records and accounts relating to receipts, charges and expenditures of the Joint Venture.

PARAGRAPH 15. Profits and Losses. The parties shall share all profits and losses of the Joint Venture during any calendar year in the proportions which the cumulative total of their respective contributions as of the close of such calendar year bears to the cumulative total of their combined contributions as of the same time.

PARAGRAPH 16. Acquisition of Outside Properties. If either party shall at any time during which this Agreement is in effect acquire by purchase, lease, option, or otherwise, any outside property, or any interest therein, it shall promptly notify the other of such acquisition, and all details with respect thereto, in which case the other party, for and during a period of six (6) months following the giving of such notice, may elect to cause the same to be acquired on behalf of the Joint Venture by giving notice of such election to the party making such acquisition and by reimbursing the party making such acquisition for one-half of the amount therefore paid by such party for or toward the acquisition of such outside property, or interest therein, or expended by such party on or in connection with the same, and by agreeing to contribute to the Joint Venture, as and when the same are to be paid or expended, one-half of any further payments or expenditures required to be made for or with respect to the acquisition, preservation or maintenance of such outside property, or interest therein. Thereupon such outside property, or interest therein, shall be and become the property of the Joint Venture, and the amount or amounts contributed or to be contributed by the respective parties for the acquisition, preservation and maintenance of the same shall be in addition to the contributions herein otherwise provided to be made by the respective

parties to the Joint Venture, but shall otherwise be subject in all respects to the provisions of this Agreement relating to such contributions.

Inasmuch as Shasta has represented to Phelps Dodge that it has expended or caused to be expended at least the amount of Fifteen Thousand Dollars ($15,000.00) in acquisition of the Original Lease, in addition to the amount of the prior expenditures as defined herein, it is understood and agreed that, anything in this CLAUSE 16 to the contrary notwithstanding, Phelps Dodge shall bear the first Fifteen Thousand Dollars ($15,000.00) of the total acquisition costs of outside properties, or interests therein, taken by the Joint Venture, and the amount so to be borne by Phelps Dodge shall not be treated as a contribution to the Joint Venture.

CLAUSE 17. Use of Personnel, Equipment, etc. of Parties. It is contemplated that there may be used in the conduct of the operations of the Joint Venture equipment, machinery, tools, supplies, employees and other personnel owned or regularly employed by either of the parties. In this respect, any equipment, tools or supplies heretofore acquired by Shasta through the prior expenditures and now on hand shall be and become the property of the Joint Venture, without further payment or credits to Shasta on account thereof. In case personnel in the regular employ of or under contract to Shasta, or in case equipment, machinery, tools or supplies owned by Phelps Dodge, or personnel in the regular employ of or under contract to Phelps Dodge are used by Phelps Dodge for or in connection with the operations of the Joint Venture, the reasonable value thereof may be charged to the Joint Venture by the party furnishing

the same, subject to the following conditions:

(a) No charge shall be made for the time of executive officers of either party.

(b) The salary or wages of personnel in the employ of either party and used in the conduct of the operations of the Joint Venture, or matters directly relating thereto, may be charged to the Joint Venture at the regular salary or wage rate, including taxes, insurance, fringe benefits and similar wage or payroll costs for the time such personnel are actually engaged in conduct of operations of the Joint Venture, or matters directly relating thereto.

(c) The actual traveling costs and allowance for living and other expenses incurred for the personnel referred to under subparagraph (b) in connection with operations of the Joint Venture, or matters directly relating thereto, may be charged to the Joint Venture.

(d) Any equipment, machinery, tools or supplies furnished by Phelps Dodge and used and consumed in the operations of the Joint Venture, or permanently installed on the property of the Joint Venture, may be charged to the Joint Venture at not to exceed the lowest cost, including transportation, at which similar items might be acquired from any other available source.

(e) Equipment, machinery and tools furnished by Phelps Dodge and used in the operations of the Joint Venture, but which are not consumed or are not permanently installed on the property of the Joint Venture, may be charged to the Joint Venture, based on the time required for the use thereof by the Joint Venture, at rates, including transportation costs, not in excess of the lowest rates at which similar items might be obtained for use from any other available source.

CLAUSE 11. Organization of New Corporation. At such time as the parties shall mutually agree, but not later than December 31, 1961, the parties shall cause the New Corporation to be organized under the laws of such state, and in accordance with such articles of incorporation and by-laws, as the Joint Board shall prescribe, but including provisions for the following:

(a) Cumulative voting.

(b) Pre-emptive rights on the part of the stockholders to subscribe to additional shares of the capital stock, subject, however, to the provisions of CLAUSE 19 hereof.

(c) Two-thirds vote of the issued and outstanding stock to authorize amendment of the articles of incorporation, sale of substantially all of the corporate property, merger with any other corporation, or liquidation of the corporate business.

(d) Due representation on the first board of directors of all stockholders, including minority stockholders.

As soon as possible following organization of the New Corporation it shall be qualified to do business in the State of California, immediately following which all property and assets of the Joint Venture shall be transferred, assigned and conveyed to the New Corporation in exchange for such number of shares of the capital stock of the New Corporation which will equal, at par, the cumulative total of the combined contributions to the Joint Venture made by the parties hereto as of the date of qualification of the New Corporation to do business in the State of California, which capital stock shall be issued to Shasta and to Phelps Dodge, or its or their nominees, respectively, in the proportions which their respective total contributions bear to the combined total of such contributions;

provided, however, that not less than 50.1% of such capital stock shall be issued to Phelps Dodge, or its nominees. The costs incurred for the incorporation, organization and qualification of the New Corporation and transfer of the property and assets of the Joint Venture thereto, shall be borne and paid by the Joint Venture.

CLAUSE 19. Additional Stock Issue. The New Corporation shall be empowered to issue, from time to time, shares of its authorized capital stock in addition to the number of shares originally to be issued pursuant to CLAUSE 18 hereof, but each stockholder of the New Corporation shall have the pre-emptive right to subscribe, at the offering price, for such additional shares in the proportions which the shares held by such stockholder immediately prior to such issue bears to the total number of shares then issued and outstanding; provided, however, that if any such stockholder does not, within three (3) months following the date upon which notice of such pre-emptive subscription right is mailed to such stockholder, at the address of such stockholder as shown on the stock records of the New Corporation, subscribe and pay, at the offering price, for the full number of shares to which such stockholder is entitled, then Phelps Dodge, during a period of thirty (30) days thereafter, may exercise such subscription right and purchase, at the offering price, the number of such additional shares not so subscribed and paid for by such other stockholder.

CLAUSE 20. Offer of Stock in Others. Except as in CLAUSE 20 hereinafter provided, neither Anaconda nor Phelps Dodge shall sell, transfer or assign any of its capital stock of the New Corporation or rights to subscribe for the same. In case

either Shasta or Phelps Dodge shall desire to sell any of its said capital stock or subscription rights, such party shall first offer the same to the other by notice in writing given to the other, stating therein the price and the terms and conditions of such offer. The party to whom such offer is given may accept the same by giving written notice of acceptance to the other within thirty (30) days after the date as of which the notice of such offer was given. In the event such offer should not be so accepted, then the party making the same shall be entitled, at any time during a period of six (6) months following the giving of notice of such offer, to sell to any third party the capital stock and stock subscription rights covered by such offer, but only at a price and on terms and conditions no more favorable to the purchaser than those contained in such offer.

It is fully understood and agreed that the provisions of this CLAUSE 20 shall not apply to the distribution by Shasta to its then stockholders of all its stock and stock subscription rights in the New Corporation, and in the event of such distribution the provisions of this Clause shall be deemed terminated and of no further force or effect.

CLAUSE 21. Arbitration. In the event any question or controversy shall arise between the parties hereto involving the application of this Agreement to any factual issue, particularly including, but not limiting the generality of the foregoing, the amount or propriety of any item in the statement submitted by Shasta of the prior expenditures, or any charge made by Phelps Dodge to the Joint Venture for or on account of equipment, machinery, employees, etc., furnished by Phelps Dodge for the operation of the Joint Venture (but not including a

question or controversy involving a strictly legal issue such as the interpretation to be placed upon this Agreement, or the inability of the parties mutually to agree on the amount of increased contributions, if any, under CLAUSE 11 hereof), and the parties are unable satisfactorily to adjust and settle such question or controversy between themselves, either party may, by notice in writing to the other, request that such question or controversy be submitted to arbitration, designating in such notice the name of the arbitrator appointed by such party. Within two (2) weeks following the giving of such notice, the other party shall name the second arbitrator by notice in writing given to the party requesting arbitration. The two (2) arbitrators so named shall promptly appoint a third arbitrator, and the question or controversy shall be heard at such time and place and according to such procedure as a majority of the arbitrators shall determine. The award in writing signed by any two (2) of the arbitrators shall be final and binding upon the parties. If a party shall fail or refuse to name the second arbitrator within the time and in the manner herein provided, then the arbitrator appointed by the party requesting arbitration shall proceed to arbitrate and determine the question or controversy as if he were an arbitrator appointed by both the parties hereto for that purpose, and his award in writing signed by him shall be final. The cost and expenses of the arbitration, including fees of the arbitrators, shall be borne by the parties in such manner as may be provided in the award.

CLAUSE 22. Notice. Any notice herein provided to be given by Hawaii to Pacific Bridge shall be given by registered mail, postage prepaid, addressed to the Office of the General

Manager, Phelps Dodge Corporation, Douglas, Arizona, and such notice shall be deemed given seventy-two (72) hours following the deposit thereof in a United States post office. Any notice herein provided to be given by Phelps Dodge to Shasta shall be given by registered mail, postage prepaid, addressed to Shasta Copper and Uranium Company, Inc., at 612 Dooly Building, Salt Lake City, Utah, and such notice shall be deemed given seventy-two (72) hours following the deposit thereof in a United States post office. The address to which notice is to be given to either party may be changed at any time by such party, upon giving written notice to the other of such change, stating therein the new address to which notices are thereafter to be given.

SECTION 21. Transferability. Neither party hereto shall transfer or assign this Agreement or any right or interest of such party in and to the Joint Venture provided for hereunder; provided, however, that Shasta may assign its interest in this Agreement to any corporation organized by it, all of the stock of which corporation shall be issued to Shasta or to Shasta's stockholders, and such corporation shall be bound by all of Shasta's obligations hereunder.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the date first hereinabove written.

SHASTA COPPER AND URANIUM COMPANY, INC.

By K. L. Stokes
Its President

Attest:

Secretary

PHELPS DODGE CORPORATION

By [illegible]

Its President

Attest:

[illegible]

Its Assistant Secretary

STATE OF UTAH }
County of Salt Lake } ss.

On this, the 18th day of July, 1953, before me, Ruth W. Atkinson, the undersigned officer, personally appeared R. L. Stokes and Ruth L. Reeves, who acknowledged themselves to be the President and Secretary, respectively, of SIERRA COPPER AND MANGANESE COMPANY, INC., a corporation, and that they, as such President and Secretary, being authorized so to do, executed the foregoing instrument in the capacity therein stated and for the purposes therein contained.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

My commission expires September 1, 1957.

Ruth W. Atkinson
Notary Public

STATE OF NEW YORK }
County of New York } ss.

On this, the 23 day of July, 1953, before me, Thomas Kavanaugh, the undersigned officer, personally appeared ROBERT C. PAGE and R. D. BARNHART, who acknowledged themselves to be the PRESIDENT and

Ass't Secretary, respectively, of PHILIPS DODGE CORPORATION, a corporation, and that they, as such President and Ass't Secretary, being authorized so to do, executed the foregoing instrument in the capacity therein stated and for the purposes therein contained.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

My commission expires March 30 1957.

Henry Kassman
Notary Public

Notary [illegible] York

OFFICIAL FILE COPY
DMEA
RECEIVED JUL 15 1957

DATE	INITIALS	CODE

Shasta Minerals and Chemical Company
612 Dooly Building
Salt Lake City 1, Utah

Gentlemen:

In accordance with Clause 11 of the Joint Venture Agreement dated July 1, 1956, it is mutually agreed that we shall each contribute $125,000.00 to the Joint Venture for the period ending December 31, 1957, making a total of $250,000.00 which shall be in addition to and in excess of the amount specified for said period in the Joint Venture Agreement.

It is understood that if the parties shall determine at any time that the full amount of the additional contribution will not be required for the year 1957, the same may be reduced by action of the parties, and each of us shall then be liable to contribute only our share of the reduced amount. It is further understood that payment of our respective shares of the additional contribution shall be made by each of us at such time or times as the Joint Board shall prescribe, and that any amounts so paid and not expended during the year 1957 shall be credited against contributions for the subsequent year or years. If Phelps Dodge Corporation shall withdraw from the venture at the end of 1957 as provided by the agreement, any unexpended part of the additional contribution as provided by this letter, shall be distributed to the parties as their interest may appear.

If the foregoing is in accordance with your understanding, please indicate by signing and returning the enclosed copy of this letter.

Yours very truly,

PHELPS DODGE CORPORATION

By Philip C. Lawson
Its General Manager

Approved and Accepted:

SHASTA MINERALS & CHEMICAL COMPANY

By [illegible]
Its

Dated: December 21, 1956
W Jackson Dec 24, 1956

JOINT VENTURE AGREEMENT

THIS AGREEMENT, entered into as of the 1st day of July, 1956, by and between SHASTA COPPER AND URANIUM COMPANY, INC., a Utah corporation, herein referred to as "Shasta", and PHELPS DODGE CORPORATION, a New York corporation, herein referred to as "Phelps Dodge",

W I T N E S S E T H :

The parties mutually agree to enter into a joint venture on and subject to the terms and conditions as follows:

CLAUSE 1. Definition of Terms. As used in this Agreement, the following words and phrases shall be deemed to have the meanings set forth below:

(a) Walker. The Walker Engineering Corporation (formerly known and referred to as "Walker Corporation"), a corporation organized and existing under the laws of the State of Nevada.

(b) Original Lease. That certain Mining Lease and Option dated January 18, 1954, from Walker to K. L. Stoker, covering patented lode and placer mining claims and other tracts in the West Shasta Copper Belt, as amended by Agreement to Amend Mining Lease and Option dated October 20, 1954, and as further amended by Amendment to Agreement to Amend Mining Lease and Option dated November 21, 1955.

(c) New Lease. The new lease and option agreement entered into by Shasta with Walker as of July 1, 1956, which shall cancel and take the place of the Original Lease from and after July 1, 1956.

(d) West Shasta Copper Belt. That certain area within the Flat Creek and Backbone Mining Districts, Shasta County, California, as designated and shown on the map attached as Exhibit B to the New Lease.

(e) Walker Properties. All patented and unpatented mining claims and other tracts of land in the West Shasta Copper Belt owned by Walker, specifically including those described in the Original Lease, the property referred to in the Original Lease as the Balaklala property, and any patented or unpatented mining claims located or acquired by Walker or Shasta subsequent to January 18, 1954, and prior to the date of the New Lease, and any patented or unpatented mining claims located by Walker, or by either of the parties hereto in the name of Walker, pursuant to the provisions of the New Lease.

(f) Outside Property or Properties. Any properties in the West Shasta Copper Belt other than the Walker properties.

(g) D. M. E. A. Loans. Funds loaned or to be loaned to either of the parties hereto by the United States through the Defense Minerals Exploration Administration, or its successor agency, for exploration of the Walker properties.

(h) Joint Venture. The joint venture to be entered into by the parties pursuant to this Agreement, and which shall be known as the "Shasta - Phelps Dodge Joint Venture".

(i) Contributions. The amounts in this Agreement provided to be paid by the respective parties toward the costs and expenditures of the Joint Venture.

(j) Prior Expenditures. The net amount paid by Shasta to Walker under paragraphs V and VI of the Original Lease and actually expended by Walker prior to July 1, 1956, for acquisition, preservation and exploration of the Walker properties,

after deducting any amounts realized by or for the credit of Shasta prior to such date from timber sales and from D. M. E. A. loans, but it being understood that such net amount shall not exceed Eighty Thousand Dollars ($80,000.00).

(k) Prior Credits. Any amounts realized by Shasta subsequent to July 1, 1956, from D. M. E. A. loans in reimbursement of the prior expenditures, together with any credits or receivables from Walker on account of the prior expenditures.

(l) New Corporation. The corporation to be organized pursuant to CLAUSE 18 hereof.

(m) Joint Board. The board of five members provided for in CLAUSE 6 hereof to consist of three (3) nominees of Phelps Dodge and two (2) nominees of Shasta.

CLAUSE 2. Negotiation of New Lease. Concurrently with execution of this Agreement, Shasta has executed and entered into the New Lease in form approved by Phelps Dodge. The New Lease, together with the Prior Credits, shall be and become the property of the Joint Venture. Promptly following execution of this Agreement Shasta shall execute and deliver to Phelps Dodge appropriate assignments and declarations of trust, in form approved by Phelps Dodge and suitable for recording, covering all rights of Phelps Dodge in and to the New Lease under the terms of this Agreement. Shasta shall not enter into any agreements amending or varying the terms of the New Lease without prior written approval of Phelps Dodge.

CLAUSE 3. Period of Joint Venture. The Joint Venture shall commence as of July 1, 1956, and unless sooner terminated by reason of Phelps Dodge's withdrawal pursuant to CLAUSE 9 hereof, shall continue until organization of the New Corpora-

tion and transfer to it of the New Lease and all other assets of the Joint Venture.

CLAUSE 4. Purpose of Joint Venture. The purpose of the Joint Venture shall be to acquire the New Lease and to explore, develop, equip, place in production and operate the Walker Properties and such of the outside properties as may be acquired by the Joint Venture under the provisions of this Agreement, including installation of such plants and facilities for production and beneficiation of ores and other products from the properties of the Joint Venture as may be deemed economically justified.

CLAUSE 5. Management of Joint Venture. The Joint Venture, and all exploration, development, construction and production operations to be conducted hereunder shall (subject to approval by the Joint Board to the extent hereinafter provided) be under the management and control of Phelps Dodge, particularly including, without limiting the generality of the foregoing, the following:

(a) The receipt, deposit, custody, control and expenditure of the funds of the Joint Venture.

(b) The determination, selection, acquisition, installation, use and operation by the Joint Venture of geological, geophysical, drilling, exploratory, development, mining, production, metallurgical treatment, marketing and accounting methods, procedures, facilities, tools, supplies, equipment, machinery and improvements, and the selection, employment and use of consultants, geologists, geophysicists, supervisors, engineers, accountants, employees and other personnel.

CLAUSE 6. Joint Board. The Joint Board shall con-

sist of five (5) members, three (3) of whom shall be appointed by and serve as representatives of Phelps Dodge, and two (2) of whom shall be appointed by and serve as representatives of Shasta, and a decision by a majority of the members of the Joint Board on any matter provided in this Agreement to be determined by the Joint Board shall be controlling on the parties hereto. On or before August 5, 1956, each of the parties shall notify the other in writing of its respective appointees to the Joint Board, and at any time, or from time to time thereafter, each such party may replace any or all of its appointees to the Joint Board by notifying the other in writing of the appointee or appointees to be replaced and the name or names of the new appointee or appointees.

Not later than August 10, 1956, and from time to time thereafter, Phelps Dodge shall designate a member of the Joint Board to act as chairman, who shall call and preside over all meetings of the Joint Board and shall perform such other functions as the Joint Board shall authorize. The first meeting shall be called and held on or before August 15, 1956, and regular annual meetings shall be called and held on the third Monday in October of each year. Special meetings of the Joint Board may be called by the chairman at any time. The chairman shall dispatch written notice, by United States mail or telegram to each member not less than five (5) days prior to the date of the meeting, stating therein the time and place for the meeting. Members of the Joint Board shall receive no compensation for their services as such members, but shall be reimbursed by the Joint Venture for their actual travel costs and expenses in attending meetings of the Joint Board.

CLAUSE 7. Functions of Joint Board. The functions of

the Joint Board shall consist primarily of the following:

(a) At the meeting to be held on or before August 15, 1956, to approve and adopt a general operating program, and an overall budget of expenditures for the Joint Venture for the period commencing July 1, 1956, and ending December 31, 1957, and at each annual meeting to approve and adopt such program and budget for the ensuing calendar year.

(b) At special meetings to make such changes in the operating program and budget as may be considered necessary or required.

(c) At the first meeting to be held on or before August 15, 1956, to fix the date or dates for payment of the contributions to be made by the parties for the period commencing July 1, 1956, and ending December 31, 1957, and at the regular meeting to be held in 1957 and in each year thereafter to fix and determine, within the limits in CLAUSE 8(c) of this Agreement provided, the contributions to be made by the parties to the Joint Venture for the succeeding calendar year, and the date or dates during such calendar year for payment of such contributions.

(d) To authorize and approve any D. M. E. A. loans, and the terms and conditions thereof, for the benefit of the Joint Venture, it being understood that the Joint Venture will assume existing D. M. E. A. loans, and, subject to approval by the Joint Board of the exploratory programs and other terms and conditions involved thereunder, the Joint Venture will accept further advances under existing D. M. E. A. loan commitments and will prosecute pending and future applications for such loans.

CLAUSE 8. Contributions. It is contemplated that

each of the parties will contribute funds in equal amounts for the purpose of the Joint Venture as follows:

(a) For the period commencing July 1, 1956, and ending December 31, 1957, Phelps Dodge shall contribute an amount equal to the prior expenditures, plus the further amount of Fifty Thousand Dollars ($50,000.00). As expeditiously as reasonably possible, Shasta shall furnish Phelps Dodge with a full and complete statement showing the prior expenditures, and Phelps Dodge shall be given access to Shasta's books, records and accounts, including statements and accounts furnished by Walker, in order to verify the prior expenditures. If Phelps Dodge does not verify, to its satisfaction, any item of the prior expenditures as furnished by Shasta, the parties will endeavor to adjust the same, failing in which the propriety and amount of such item to be included as a prior expenditure shall be submitted to arbitration as provided in CLAUSE 21 hereof.

(b) Shasta's contribution for the period commencing July 1, 1956, and ending December 31, 1957, shall consist of a credit in the amount of the prior expenditures, in addition to which Shasta shall contribute the further amount of Fifty Thousand Dollars ($50,000.00).

(c) For the calendar year 1958 and for each calendar year thereafter to and including the calendar year 1961, each of the parties shall contribute like amounts, as determined by the Joint Board at the annual meeting preceding such calendar year, but not less than Fifty Thousand Dollars ($50,000.00) nor more than One Hundred Twenty-five Thousand Dollars ($125,000.00) by each party for each such year.

CLAUSE 9. Election Not to Make Contributions. Not later than the first day of December, 1957, or the like day of

each calendar year thereafter, either party may elect not to make its contribution for the succeeding calendar year by giving notice in writing to the other party of such election. In case Phelps Dodge shall elect not to make its contribution, the Joint Venture shall terminate as of the close of the calendar year in which it notifies Shasta of such election, and Phelps Dodge shall thereupon relinquish, release and assign to Shasta all of its interest in the Joint Venture, including the New Lease and any other assets or properties owned and held by or on behalf of the Joint Venture. In case Shasta shall elect not to make its contribution to the Joint Venture for any calendar year, or shall fail to make payment of such contribution at or prior to the time or times fixed by the Joint Board for the making thereof, Shasta shall not thereafter be entitled to make such contribution or such payment, including any payments thereafter becoming due and payable on account of Shasta's contribution for such year, and Phelps Dodge, at its election, may proceed with the expenditures up to the full amount as budgeted for such calendar year, making up by additional contribution of its own the deficiency resulting from Shasta's failure to make its contribution or payments, or Phelps Dodge may limit the expenditures for such year to the amounts available exclusive of Shasta's contribution or defaulted payments thereon.

CLAUSE 10. Payment and Deposit of Contributions. Contributions to be made by Shasta shall be paid to Phelps Dodge at the time or times and in the amounts determined by the Joint Board as herein provided, and shall be deposited by Phelps Dodge, along with contributions required or permitted to be made by Phelps Dodge hereunder and any other funds available to the

Joint Venture, into a special account in the name of the Joint Venture, with such bank as Phelps Dodge may designate, and shall be subject to withdrawal and expenditure by Phelps Dodge for the purposes of the Joint Venture. Contributions of Shasta shall be deemed paid upon receipt thereof by Phelps Dodge in the form of check, draft or money order, but only if honored on presentation.

CLAUSE 11. Increased Contributions. The parties may mutually agree to make contributions to the Joint Venture in excess of those specified to be made hereunder, to be paid and expended at such time, for such purposes, and in such manner as the parties shall mutually agree.

CLAUSE 12. Expenditures. Phelps Dodge shall expend the full amount of the contributions made for the period commencing July 1, 1956, and ending December 31, 1957, and for each calendar year thereafter, in the period or calendar year for which such contributions are made, and shall also expend the proceeds of D. M. E. A. loans and any other funds available to the Joint Venture, substantially in accordance with and for the purposes set forth in the budgets approved, adopted and amended from time to time by the Joint Board. In this respect, it is fully understood and agreed that said budgets shall specify the general purpose for which the funds of the Joint Venture are to be expended, but that within the approximate limits prescribed for each general purpose Phelps Dodge shall have and exercise full discretion as to the details of the expenditures to be made for each such purpose. It is further understood and agreed that the funds available to the Joint Venture shall, amongst other things, be expended by Phelps Dodge for the main-

tenance of insurance coverage against liabilities arising from or in connection with the operations of the Joint Venture, payment of excise, ad valorem and similar taxes on operations and property of the Joint Venture, and performance of obligations under the New Lease, including payment of minimum royalties.

CLAUSE 13. Statements of Account. Phelps Dodge shall submit to the Joint Board at each regular meeting, detailed statements and reports of all expenditures made and contemplated to be made during the calendar year in which such meeting is held. As promptly as is reasonably possible following the close of each calendar year Phelps Dodge shall cause to be prepared and filed on behalf of the Joint Venture federal and state income tax information returns covering such calendar year, and shall furnish to the members of the Joint Board detailed statements of expenditures and charges made for or to the Joint Venture during such calendar year.

CLAUSE 14. Access to Operations and Records. Phelps Dodge shall permit Shasta's appointees to the Joint Board, and such reasonable number of agents and employees as they or either of them may designate in writing, to have access at all reasonable times (a) to all properties and operations of the Joint Venture, subject to such reasonable safety regulations as Phelps Dodge may impose; (b) to all factual data, records and reports compiled or obtained by Phelps Dodge at the cost and expense of the Joint Venture, but not including confidential communications, evaluations or interpretations made by and between executive officers of Phelps Dodge with respect to such factual data, records or reports; and (c) to all books, records and accounts relating to receipts, charges and expenditures of the Joint Venture.

CLAUSE 15. Profits and Losses. The parties shall share all profits and losses of the Joint Venture during any calendar year in the proportions which the cumulative total of their respective contributions as of the close of such calendar year bears to the cumulative total of their combined contributions as of the same time.

CLAUSE 16. Acquisition of Outside Properties. If either party shall at any time during which this Agreement is in effect acquire by purchase, lease, option, or otherwise, any outside property, or any interest therein, it shall promptly notify the other of such acquisition, and all details with respect thereto, in which case the other party, for and during a period of six (6) months following the giving of such notice, may elect to cause the same to be acquired on behalf of the Joint Venture by giving notice of such election to the party making such acquisition and by reimbursing the party making such acquisition for one-half of the amount theretofore paid by such party for or toward the acquisition of such outside property, or interest therein, or expended by such party on or in connection with the same, and by agreeing to contribute to the Joint Venture, as and when the same are to be paid or expended, one-half of any further payments or expenditures required to be made for or with respect to the acquisition, preservation or maintenance of such outside property, or interest therein. Thereupon such outside property, or interest therein, shall be and become the property of the Joint Venture, and the amount or amounts contributed or to be contributed by the respective parties for the acquisition, preservation and maintenance of the same shall be in addition to the contributions herein otherwise provided to be made by the respective

parties to the Joint Venture, but shall otherwise be subject in all respects to the provisions of this Agreement relating to such contributions.

Inasmuch as Shasta has represented to Phelps Dodge that it has expended or caused to be expended at least the amount of Fifteen Thousand Dollars ($15,000.00) in acquisition of the Original Lease, in addition to the amount of the prior expenditures as defined herein, it is understood and agreed that, anything in this CLAUSE 16 to the contrary notwithstanding, Phelps Dodge shall bear the first Fifteen Thousand Dollars ($15,000.00) of the total acquisition costs of outside properties, or interests therein, taken by the Joint Venture, and the amount so to be borne by Phelps Dodge shall not be treated as a contribution to the Joint Venture.

CLAUSE 17. Use of Personnel, Equipment, etc. of Parties. It is contemplated that there may be used in the conduct of the operations of the Joint Venture equipment, machinery, tools, supplies, employees and other personnel owned or regularly employed by either of the parties. In this respect, any equipment, tools or supplies heretofore acquired by Shasta through the prior expenditures and now on hand shall be and become the property of the Joint Venture, without further payment or credits to Shasta on account thereof. In case personnel in the regular employ of or under contract to Shasta, or in case equipment, machinery, tools or supplies owned by Phelps Dodge, or personnel in the regular employ of or under contract to Phelps Dodge are used by Phelps Dodge for or in connection with the operations of the Joint Venture, the reasonable value thereof may be charged to the Joint Venture by the party furnishing

CLAUSE 18. Organization of New Corporation. At such time as the parties shall mutually agree, but not later than December 31, 1961, the parties shall cause the New Corporation to be organized under the laws of such state, and in accordance with such articles of incorporation and by-laws, as the Joint Board shall prescribe, but including provisions for the following:

(a) Cumulative voting.

(b) Pre-emptive rights on the part of the stockholders to subscribe to additional shares of the capital stock, subject, however, to the provisions of CLAUSE 19 hereof.

(c) Two-thirds vote of the issued and outstanding stock to authorize amendment of the articles of incorporation, sale of substantially all of the corporate property, merger with any other corporation, or liquidation of the corporate business.

(d) Due representation on the first board of directors of all stockholders, including minority stockholders.

As soon as possible following organization of the New Corporation it shall be qualified to do business in the State of California, immediately following which all property and assets of the Joint Venture shall be transferred, assigned and conveyed to the New Corporation in exchange for such number of shares of the capital stock of the New Corporation which will equal, at par, the cumulative total of the combined contributions to the Joint Venture made by the parties hereto as of the date of qualification of the New Corporation to do business in the State of California, which capital stock shall be issued to Shasta and to Phelps Dodge, or its or their nominees, respectively, in the proportions which their respective total contributions bear to the combined total of such contributions;

the same, subject to the following conditions:

(a) No charge shall be made for the time of executive officers of either party.

(b) The salary or wages of personnel in the employ of either party and used in the conduct of the operations of the Joint Venture, or matters directly relating thereto, may be charged to the Joint Venture at the regular salary or wage rate, including taxes, insurance, fringe benefits and similar wage or payroll costs for the time such personnel are actually engaged in conduct of operations of the Joint Venture, or matters directly relating thereto.

(c) The actual traveling costs and allowance for living and other expenses incurred for the personnel referred to under subparagraph (b) in connection with operations of the Joint Venture, or matters directly relating thereto, may be charged to the Joint Venture.

(d) Any equipment, machinery, tools or supplies furnished by Phelps Dodge and used and consumed in the operations of the Joint Venture, or permanently installed on the property of the Joint Venture, may be charged to the Joint Venture at not to exceed the lowest cost, including transportation, at which similar items might be acquired from any other available source.

(e) Equipment, machinery and tools furnished by Phelps Dodge and used in the operations of the Joint Venture, but which are not consumed or are not permanently installed on the property of the Joint Venture, may be charged to the Joint Venture, based on the time required for the use thereof by the Joint Venture, at rates, including transportation costs, not in excess of the lowest rates at which similar items might be obtained for use from any other available source.

provided, however, that not less than 50.1% of such capital stock shall be issued to Phelps Dodge, or its nominees. The costs incurred for the incorporation, organization and qualification of the New Corporation and transfer of the property and assets of the Joint Venture thereto, shall be borne and paid by the Joint Venture.

CLAUSE 19. Additional Stock Issues. The New Corporation shall be empowered to issue, from time to time, shares of its authorized capital stock in addition to the number of shares originally to be issued pursuant to CLAUSE 18 hereof, but each stockholder of the New Corporation shall have the pre-emptive right to subscribe, at the offering price, for such additional shares in the proportions which the shares held by such stockholder immediately prior to such issue bears to the total number of shares then issued and outstanding; provided, however, that if any such stockholder does not, within three (3) months following the date upon which notice of such pre-emptive subscription right is mailed to such stockholder, at the address of such stockholder as shown on the stock records of the New Corporation, subscribe and pay, at the offering price, for the full number of shares to which such stockholder is entitled, then Phelps Dodge, during a period of thirty (30) days thereafter, may exercise such subscription right and purchase, at the offering price, the number of such additional shares not so subscribed and paid for by such other stockholder.

CLAUSE 20. Offer of Stock to Others. Except as in CLAUSE 20 hereinafter provided, neither Shasta nor Phelps Dodge shall sell, transfer or assign any of its capital stock of the New Corporation or rights to subscribe for the same. In case

either Shasta or Phelps Dodge shall desire to sell any of its said capital stock or subscription rights, such party shall first offer the same to the other by notice in writing given to the other, stating therein the price and the terms and conditions of such offer. The party to whom such offer is given may accept the same by giving written notice of acceptance to the other within thirty (30) days after the date as of which the notice of such offer was given. In the event such offer should not be so accepted, then the party making the same shall be entitled, at any time during a period of six (6) months following the giving of notice of such offer, to sell to any third party the capital stock and stock subscription rights covered by such offer, but only at a price and on terms and conditions no more favorable to the purchaser than those contained in such offer.

It is fully understood and agreed that the provisions of this CLAUSE 20 shall not apply to the distribution by Shasta to its then stockholders of all its stock and stock subscription rights in the New Corporation, and in the event of such distribution the provisions of this Clause shall be deemed terminated and of no further force or effect.

CLAUSE 21. Arbitration. In the event any question or controversy shall arise between the parties hereto involving the application of this Agreement to any factual issue, particularly including, but not limiting the generality of the foregoing, the amount or propriety of any item in the statement submitted by Shasta of the prior expenditures, or any charge made by Phelps Dodge to the Joint Venture for or on account of equipment, machinery, employees, etc., furnished by Phelps Dodge for the operation of the Joint Venture (but not including a

question or controversy involving a strictly legal issue such as the interpretation to be placed upon this Agreement, or the inability of the parties mutually to agree on the amount of increased contributions, if any, under CLAUSE 11 hereof), and the parties are unable satisfactorily to adjust and settle such question or controversy between themselves, either party may, by notice in writing to the other, request that such question or controversy be submitted to arbitration, designating in such notice the name of the arbitrator appointed by such party. Within two (2) weeks following the giving of such notice, the other party shall name the second arbitrator by notice in writing given to the party requesting arbitration. The two (2) arbitrators so named shall promptly appoint a third arbitrator, and the question or controversy shall be heard at such time and place and according to such procedure as a majority of the arbitrators shall determine. The award in writing signed by any two (2) of the arbitrators shall be final and binding upon the parties. If a party shall fail or refuse to name the second arbitrator within the time and in the manner herein provided, then the arbitrator appointed by the party requesting arbitration shall proceed to arbitrate and determine the question or controversy as if he were an arbitrator appointed by both the parties hereto for that purpose, and his award in writing signed by him shall be final. The cost and expenses of the arbitration, including fees of the arbitrators, shall be borne by the parties in such manner as may be provided in the award.

CLAUSE 22. Notice. Any notice herein provided to be given by Shasta to Phelps Dodge shall be given by registered mail, postage prepaid, addressed to the Office of the General

Manager, Phelps Dodge Corporation, Douglas, Arizona, and such notice shall be deemed given seventy-two (72) hours following the deposit thereof in a United States post office. Any notice herein provided to be given by Phelps Dodge to Shasta shall be given by registered mail, postage prepaid, addressed to Shasta Copper and Uranium Company, Inc., at 612 Dooley Building, Salt Lake City, Utah, and such notice shall be deemed given seventy-two (72) hours following the deposit thereof in a United States post office. The address to which notice is to be given to either party may be changed at any time by such party, upon giving written notice to the other of such change, stating therein the new address to which notices are thereafter to be given.

CLAUSE 23. Nonassignability. Neither party hereto shall transfer or assign this Agreement or any right or interest of such party in and to the Joint Venture provided for hereunder; provided, however, that Shasta may assign its interest in this Agreement to any corporation organized by it, all of the stock of which corporation shall be issued to Shasta or to Shasta's stockholders, and such corporation shall be bound by all of Shasta's obligations hereunder.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the date first hereinabove written.

SHASTA COPPER AND URANIUM COMPANY, INC.

By K. L. Stokes
Its President

Attest:

Fred L. Feese
Its Secretary

PHELPS DODGE CORPORATION

By Robert H Page
Its President

Attest:

R S Barnes Asst.
Its Assistant Secretary

STATE OF UTAH)
) ss.
County of Salt Lake)

On this, the 18th day of July, 1956, before me, Ruth W. Wilkinson, the undersigned officer, personally appeared R. L. Stoker and Reed L. Reese, who acknowledged themselves to be the President and Secretary, respectively, of SHASTA COPPER AND URANIUM COMPANY, INC., a corporation, and that they, as such President and Secretary, being authorized so to do, executed the foregoing instrument in the capacity therein stated and for the purposes therein contained.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

My commission expires September 1- 1959.

Ruth W. Wilkinson
Notary Public

STATE OF NEW YORK)
) ss.
County of New York)

On this, the 23 day of July, 1956, before me, Henry Kasschau, the undersigned officer, personally appeared ROBERT G. PAGE and R. D. BARNHART, who acknowledged themselves to be the PRESIDENT and

Ass't Secretary, respectively, of PHELPS DODGE CORPORATION, a corporation, and that they, as such President and Ass't Secretary, being authorized so to do, executed the foregoing instrument in the capacity therein stated and for the purposes therein contained.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

My commission expires March 30 1957.

Henry Kassman
Notary Public

77591

LEASE AND OPTION

THIS LEASE AND OPTION, made and entered into as of the First day of July, 1956, by and between WALKER ENGINEERING CORPORATION, a Nevada corporation, hereinafter called "Walker", and SHASTA COPPER AND URANIUM COMPANY, INC., a Utah corporation, hereinafter called "Shasta",

W I T N E S S E T H:

WHEREAS, Walker is the owner of several groups of patented and unpatented lode and placer mining claims and other tracts of land, more particularly described in Exhibit A hereto attached, and being hereinafter referred to as "the Mining Properties", and

WHEREAS, the Mining Properties are situated in that certain area in the Flat Creek and Backbone Mining Districts, Shasta County, California, known and herein designated as "the West Shasta Copper Belt", and being shown as such on Exhibit B hereto attached, and

WHEREAS, Walker made and entered into a Mining Lease and Option covering said lode and placer mining claims and other tracts of land with K. L. Stoker, a resident of Salt Lake City, Utah, which said Mining Lease and Option was dated January 18, 1954, and

WHEREAS, the interest of said K. L. Stoker in said Mining Lease and Option was, on or about the 2nd day of April, 1954, duly assigned to Shasta, and

WHEREAS, said Mining Lease and Option was amended by Agreement to Amend Mining Lease and Option dated October 20, 1954, and by Amendment to Agreement to Amend Mining Lease and Option dated November 21, 1955, both of said amendatory agreements having been executed as of such dates by Walker and Shasta, and

WHEREAS, said Mining Lease and Option and said amendatory agreements are hereinafter referred to as the "Original Lease", and

WHEREAS, subject to the provisions of paragraph XXII of this Lease and Option, Walker and Shasta desire to cancel the Original Lease as of July 1, 1956, and to enter into this Lease

and Option,

NOW, THEREFORE, in consideration of the premises and the mutual covenants and agreements hereinafter contained, and the sum of Ten Dollars ($10.00) in hand paid by each party to the other, the receipt whereof is hereby acknowledged, the parties do hereby agree as follows:

I. LEASE OF MINING PROPERTIES. Walker does hereby lease to Shasta all properties now owned by Walker and located in the West Shasta Copper Belt, specifically including the Mining Properties as described in Exhibit A hereto attached, together with all unpatented mining claims which may be located in the name of Walker (and not purchased or otherwise acquired from others) in the West Shasta Copper Belt during the term of this Lease and Option as provided in paragraph IX hereof.

II. TERM OF LEASE AND OPTION. The term of this Lease and Option shall be for the period commencing July 1, 1956, and ending May 31, 2053, unless sooner terminated as herein provided.

III. RIGHTS OF SHASTA. During the term of this Lease and Option Shasta shall have the right to conduct exploratory, drilling, mining and metallurgical operations on the Mining Properties; to extract, produce, remove, process, ship and sell or otherwise dispose of ores, minerals and mineral products; to cut, use, sell and dispose of timber thereon or to sell standing timber, and to permit others to cut and remove the same; to excavate, remove, dump and dispose of rock, tailings and other waste materials; and otherwise to use the Mining Properties for any lawful purpose and to develop, produce, use, remove, exploit and sell the natural resources thereof. The rights of Shasta shall be subject to existing contracts for removal of timber and scrap iron, and for grazing, and to the drilling contract as set forth in paragraph XV hereof, but all proceeds otherwise receivable by Walker under said contracts from timber, scrap iron and grazing rentals shall be assigned and paid to Shasta and shall be considered as gross income from the Mining Properties, subject to the provisions of paragraph VII hereof.

IV. ROYALTIES.

(a) Royalties on Production, etc. Shasta shall pay to Walker a royalty equal to two and one-half per cent (2½%) of the gross income received during the term of this Lease and Option by Shasta from the Mining Properties, including, but not limited to, proceeds from the sale of ore, concentrates, timber and scrap iron (but only scrap iron now located on the Mining Properties) and from grazing fees and other land rentals, which said royalty shall be determined as follows:

(i) Ore and Concentrates Sold to Custom Smelters. In the case of ores and concentrates shipped and sold by Shasta to a custom smelter, (it being understood that the term "custom smelter" shall include a custom electrolytic zinc plant) the royalty shall be based upon the net smelter returns for the same. The term "net smelter returns" shall mean the net amount paid by such custom smelter for the ore or concentrates, after deduction of custom smelting costs, charges and penalties, including, but not limited to, metal losses, penalties for impurities, refining, and freight from smelter to refinery and from refinery to market, and after deduction of all costs of transporting the ores and concentrates from the Mining Properties to the custom smelter (irrespective of whether such transportation costs shall have been paid or incurred by Shasta or the custom smelter in the first instance).

(ii) Ore and Concentrates Processed by Custom Smelters on a Toll Basis. In the case of ores and concentrates shipped by Shasta to a custom smelter for processing on a toll basis, with the metals or other products being returned to Shasta, such ores or concentrates shall be deemed to have been sold to and purchased by such smelter, and the royalty shall be based on the net smelter returns therefor, as defined in subparagraph (a)(i) hereof and as nearly as the same can be reasonably ascertained, [illegible] would have been received by Shasta if [illegible]

trates had in fact been sold to and purchased by such custom smelter.

(iii) Ore and Concentrates Smelted by Shasta, etc. It is understood and agreed that ores and concentrates may be shipped to a smelter owned or controlled by Shasta or an assignee of any interest of Shasta in this Lease and Option. The ores and concentrates shipped to such smelter shall be weighed, sampled and assayed at such smelter in accordance with standard custom smelting methods, and Walker shall have the same rights and privileges of checking and verifying the accuracy of such weighing, sampling and assaying methods and results as are customarily afforded the vendors of ores and concentrates by a custom smelter. Such ores or concentrates shall be deemed to have been sold to and purchased by such smelter, and royalties thereon shall be based on the net smelter returns therefor as defined in subparagraph (a)(i) hereof, which net smelter returns shall be established in such manner as will be not less than the most favorable net smelter returns, as nearly as the same can reasonably be ascertained, which could have been obtained under contract from an available custom smelter for shipment and sale to it during the same period of time of ores and concentrates from the Mining Properties of like character and quantities.

(iv) Intermediate Processing of Ore. Should any ore from the Mining Properties be delivered for processing to a mill or treatment plant, whether owned or operated in whole or in part by Shasta, any subsidiary or assignee of Shasta, the ore delivered to such mill or treatment plant shall be kept separate from ore from other Mining properties, and the mill products therefrom shall be kept separate from the mill products from other properties, and Walker's royalties shall be based on the net smelter returns on the concentrates therefrom subject to

smelter deductions and transportation costs from the mill or treatment plant to the smelter, as provided in paragraph IV (a)(i) but not subject to milling costs or profits or to transportation costs from the Mining Properties to the mill or treatment plant.

(v) Sales to Acid Plants. If any sales of ore, concentrates or other products be made to an acid plant or to any purchaser other than a custom smelter or custom mill, the royalty therefrom shall be based upon the amount paid by the purchaser for such ore or concentrates in the form in which shipped and sold, after deducting any charges reasonably made by such purchaser and costs of transporting said ore or concentrates from the shipment point to such purchaser.

(vi) Timber and Rentals. Royalties on the sale of timber and from land rentals shall be based on the gross proceeds realized by Shasta from such transactions.

(vii) Payment of Royalties. Royalties on ore or concentrates sold to a custom smelter or other purchaser shall be deducted from the net smelter returns or the net amount to be paid for the same, and shall be remitted directly to Walker, together with a copy of each settlement sheet. Royalties on ore or concentrates shipped to a custom smelter for processing on a toll basis shall be paid to Walker by the time the same would have been paid if such ore or concentrates had been sold to such custom smelter. Royalties on ore shipped to a smelter owned or controlled by Shasta or an assignee of any interest of Shasta in this Lease and Option, shall be paid to Walker not later than the 25th day of the second calendar month following the calendar month in which such ore or concentrates are received at such smelter. Royalties on gross proceeds from other sources, such as from timber sales and land rentals, shall be paid to Walker not later

than the 25th day of the calendar month following the calendar month in which such proceeds are received by Shasta.

(b) Minimum Royalty. The minimum royalty payable by Shasta to Walker under the provisions hereof shall be as follows:

(i) For the period commencing July 1, 1956, and ending December 31, 1956, the minimum royalty shall be Twelve Thousand Five Hundred Dollars ($12,500.00), less the amount of Five Thousand Dollars ($5,000.00), or less the amount of five per cent (5%) of the gross expenditures made during the entire calendar year of 1956 (including those made under the Original Lease) for exploration, development and mining of the Mining Properties (including the cost of engineering, geological, geophysical and metallurgical testing work properly applicable thereto) and for the installation of permanent equipment, buildings and facilities for the mining of said properties, whichever of said amounts of reduction is the smaller.

(ii) The minimum royalty for the annual period commencing January 1, 1957, and for each annual period thereafter during the term of this Lease and Option shall be Twenty-five Thousand Dollars ($25,000.00) less the amount of Ten Thousand Dollars ($10,000.00), or less the amount of ten per cent (10%) of the gross expenditures made during such calendar year for the exploration, development and mining of the Mining Properties (including the cost of engineering, geological, geophysical and metallurgical testing work properly applicable thereto) and for the installation of permanent equipment, buildings and facilities for the mining of said properties, whichever of said amounts of reduction is the smaller.

(iii) In the event the gross expenditures referred to in subparagraph (i) above made during the entire calendar year of 1956 exceed the amount of One Hundred

Thousand Dollars ($100,000.00), or the gross expenditures referred to in subparagraph (ii) above made during the calendar year 1957, or during any calendar year thereafter, exceed the amount of One Hundred Thousand Dollars ($100,000.00), then, for the purpose of computing minimum royalties hereunder, the amount of such excess shall be carried forward to the succeeding calendar year and shall be considered as the first money expended during such succeeding calendar year, but any such excess may not be carried forward to more than the three (3) calendar years immediately following the calendar year in which such excess expenditure was actually made.

(iv) The minimum royalty for any calendar year shall be paid to Walker not later than the last day of February following the close of such calendar year; it being understood and agreed that all royalties on gross income from the Mining Properties paid to Walker during such calendar year shall be credited and applied against the minimum royalty otherwise payable to Walker for such calendar year.

(c) Shasta not Obligated to Produce. It is fully understood and agreed that Shasta shall not be obligated or required to carry on any activities or operations which will produce gross income subject to royalties, and if the amount of the royalties payable by Shasta on gross income during any calendar year is less than the minimum royalties herein provided for such year, Shasta shall be obligated only for the difference as herein provided. Nothing in this subparagraph shall affect Shasta's obligation to make the expenditures provided in paragraph V hereof.

V. MINIMUM EXPENDITURES. During the period commencing July 1, 1956, and ending December 31, 1957, Shasta shall expend not less than One Hundred Fifty Thousand Dollars ($150,000.00) for or in direct connection with the exploration, development and mining of the Mining Properties (excluding general overhead and general administrative expenses), and the installation of permanent

equipment, buildings and facilities thereon, and for ad valorem taxes on the Mining Properties, and the costs of locating and performing assessment work on unpatented mining claims comprising the Mining Properties, or for any of said purposes.

VI. WARRANTIES OF TITLE. Walker represents and warrants that it is the owner and holder of good and merchantable title to the Mining Properties, free and clear of all liens, charges and encumbrances, subject only to the provisions of this Lease and Option, obligations for repayment of existing D.M.E.A. loans, ad valorem taxes for the year 1956 and subsequent years, reservations and exceptions contained in the original United States patents, and in the case of unpatented mining claims to all conflicts with patented mining claims and with prior valid unpatented mining claims, and the paramount title of the United States, and to existing contracts for removal of timber, scrap iron and for grazing and to all existing rights of way and easements. Walker represents and warrants that it has full power and authority to enter into this Lease and Option and to convey the Mining Properties in accordance with the terms hereof.

VII. REPAYMENT OF LOANS MADE BY SHASTA TO WALKER. Shasta has made loans or advances to Walker under the provisions of the Original Lease for which there remains a balance of Fifteen Thousand Three Hundred Eighty-eight and 88/100 Dollars ($15,388.88) which has not been repaid. Shasta shall credit against said balance all proceeds hereafter received by Shasta from the sale of timber from the Mining Properties, and the proceeds so credited shall not be subject to royalties otherwise payable to Walker. If at any time royalties are payable to Walker on proceeds from the sale of ore or concentrates and the full amount of said balance has not been discharged by proceeds from timber sales, there shall be credited against the then remaining balance one-half (1/2) of the royalties otherwise payable to Walker on proceeds from the sale of ore or concentrates until such balance has been discharged in full and the amount to be paid to Walker as such royalties (but not the minimum royalty) shall be reduced by the amount so credited.

In the event this Lease and Option shall be cancelled for any reason, the obligation of Walker to repay Shasta the then balance of said loans or advances shall survive and be payable by Walker out of one-half (1/2) of any net income received by Walker from the Mining Properties, or in the event of sale thereof, out of the net proceeds of such sale. Such obligation to repay shall continue so long as Shasta exists as a legal entity, but in no event for more than ten (10) years after cancellation of this Lease and Option.

VIII. OPTION FOR PURCHASE OF THE PROPERTIES. If and when during the term of this Lease and Option Walker shall have been paid, either as royalties or additional payments as herein provided, or both, an aggregate amount equal to the value of 10,000,000 pounds of copper at the price per pound for electrolytic copper, domestic refinery, as quoted in the "E & M J Metal and Mineral Markets" as of the respective dates upon which any such royalties or additional payments shall have been paid, then Walker shall convey the Mining Properties to Shasta by good and sufficient deeds of conveyance, and this Lease and Option shall forthwith cease and terminate, and Shasta shall not be liable for the further payment to Walker of any royalties hereunder. It is fully understood and agreed that Shasta, at its option, may at any time, or from time to time, make payments to Walker in addition to the royalties becoming due and payable hereunder, which additional payments shall be applied and credited, in the manner herein provided, against the value of said 10,000,000 pounds of copper. For the purpose of this paragraph, each amount paid to Walker as royalties or additional payments hereunder shall be divided by the said price per pound of copper so quoted for the date upon which such amount was paid to Walker, and the resulting equivalent in pounds of copper shall apply against the total pounds of copper aforesaid. It is expressly agreed that the purpose of settling in this manner is to provide against the possibility of inflation or deflation of the dollar.

IX. SHASTA ACQUIRING ADJACENT PROPERTIES. It is fully

understood and agreed that Shasta may acquire from others through purchase, lease or otherwise, any mining claims or properties, in addition to the Mining Properties as described in Exhibit A, and Walker shall have no right, title or interest therein, either in the nature of royalty rights or otherwise. It is understood and agreed, however, that any unpatented lode or placer mining claims in the West Shasta Copper Belt validly located furing the term of this Lease and Option by or on behalf of Walker, and not purchased, leased or otherwise acquired from others, shall be located in the name of Walker and shall become the property of Walker subject to the terms and provisions of this Lease and Option the same as if originally described herein, but Walker shall not locate any such mining claims during the term of this Lease and Option without the prior written consent of Shasta first had and obtained, provided that if Shasta refuses to consent to any such locations by Walker, Walker shall have the right to make such locations without any expense to Shasta, and claims so located shall not be subject to the terms of this Lease and Option.

X. ENCUMBRANCES. Shasta agrees to keep the Mining Properties free and clear of liens and encumbrances for labor performed or materials furnished to Shasta for use on the Mining Properties during the term of this Lease and Option. Shasta shall post and maintain on the Mining Properties during the term of this Lease and Option and record the same in the office of the County Recorder, Shasta County, California, in accordance with the applicable statutes of the State of California, a notice in substantially the form attached hereto as Exhibit C. It is further understood and agreed that neither of the parties shall do any act which shall cause the Mining Properties to become subject to any liens or encumbrances other than liens for taxes pending payment thereof by Shasta in accordance with the provisions of paragraph XI hereof; provided, however, that Shasta may apply for and obtain D. M. E. A. loans from the appropriate United States Government lending agency similar to the existing D. M. E. A. loans and that Walker shall execute with the lending agency such

loan agreements as may be necessary to enable Shasta to obtain or secure any such loans, and that the provisions for repayment of such loans shall not be deemed encumbrances within the meaning of this paragraph.

XI. TAXES. Shasta shall pay before the same become delinquent all ad valorem taxes levied and assessed against the Mining Properties and becoming due and payable during the term of this Lease and Option, together with any and all license, excise and production taxes arising or resulting from the operations of Shasta hereunder; it being understood, however, that Shasta may contest the amount and validity of any such taxes, and in such event shall not be obligated or required to pay the same until the amount and validity thereof has been finally determined.

XII. ASSESSMENT WORK. Shasta agrees to perform, at its own expense, all necessary annual assessment work on or for the benefit of the unpatented mining claims included in the Mining Properties for the assessment year ending July 1, 1957, and for each assessment year thereafter in which this Lease and Option shall not have been cancelled and terminated prior to June 1st of such assessment year, and shall record proof of labor therefor.

XIII. SALE OF ORE AND COMMINGLING OF PRODUCTS. All ore and concentrates shipped from the Mining Properties to a custom smelter shall be shipped to that custom smelter which, in the judgment of Shasta,(such judgment to be reasonably made and to take into consideration the interest of Walker) offers the most favorable net smelter returns, after taking into consideration the cost of transportation. Without the written consent of Walker first had and obtained, Shasta shall not mix or commingle ore, concentrates, dumps, tailings or other products of the Mining Properties with other ore, concentrates, dumps, tailings or other products from other mining properties during mining, milling, treatment, transportation or shipment thereof by Shasta.

XIV. COMPLIANCE WITH LAWS AND RIGHT OF INSPECTION. Shasta shall comply with all federal and state laws applicable to operations conducted by it on the Mining Properties. Walker or its

agents or designees shall have the right at all reasonable times to inspect the Mining Properties together with all maps, records and books pertaining thereto, including production, shipments and gross income therefrom.

XV. EXISTING DRILLING CONTRACT. Walker has entered into a drilling contract with MacPherson Drilling Company, dated September ____, 1955, and two contracts for the sale of timber with W. S. Price, dated September 30, 1955 and March 30, 1956, respectively, as amended and supplemented, which contracts have not yet been completed. Shasta agrees to assume all of the obligations, financial and otherwise, of Walker under said contracts.

XVI. LITIGATION. In the event of any litigation concerning any of the Mining Properties or the operations under this Lease and Option, involving any third person whomsoever, the parties agree to cooperate in the disposition and handling of such litigation. The cost of any such litigation which bears directly upon or arises out of such operations or the titles to the Mining Properties shall be borne by Shasta, except where such litigation is caused solely by any act or omission of Walker. In the event either party to this Lease and Option obtains a judgment against the other party arising out of this Lease and Option, or the provisions hereof, the judgment creditor shall not levy any execution upon the interest of the judgment debtor in the Mining Properties until the expiration of five (5) years from the date such judgment becomes final.

XVII. SHASTA'S OPTION TO CANCEL. Shasta shall have the right to cancel and surrender this Lease and Option at any time from and after December 31, 1957, by giving Walker at least thirty (30) days' previous notice in writing, stating therein the date as of which such cancellation is to be effective, and upon satisfaction by Shasta of all its obligations arising

hereunder to the date of such cancellation, this Lease and Option shall be terminated and of no further force or effect, except for the provisions of paragraphs VII and XIX hereof. In the event of any such cancellation, the minimum royalty herein provided to be paid for the calendar year in which such cancellation occurs shall be pro-rated to the date of cancellation, and Shasta shall be obligated only for that portion of such minimum royalty as is represented by the portion of the calendar year expired to the date of cancellation. In the event of such cancellation, Shasta agrees to execute and deliver to Walker a quitclaim deed to the Mining Properties, subject, however, to Shasta's rights under paragraphs VII and XIX hereof.

XVIII. WALKER'S RIGHT TO CANCEL. In the event Shasta shall default in any obligation or covenant contained or provided herein as and when the performance thereof becomes due, and such default shall continue for a period of sixty (60) days, Walker may give notice to Shasta of such default and unless the same is remedied within twenty (20) days following receipt by Shasta of such notice, Walker may thereupon cancel and terminate this Lease and Option, except for the provisions of paragraph VII hereof. In the event of such cancellation, Shasta agrees to execute and deliver to Walker a quitclaim deed to the Mining Properties, subject, however, to the rights of Shasta under paragraph VII hereof.

XIX. REMOVAL OF BUILDINGS AND EQUIPMENT AND DELIVERY OF FACTUAL DATA. Upon cancellation or termination of this Lease and Option, Shasta shall, within six (6) months from the date of such cancellation, remove all machinery, equipment and facilities which can be removed without substantial damage to the Mining Properties or the permanent equipment, buildings and facilities thereon (unless such damage can be and is repaired by Shasta promptly following such removal), but shall

leave all buildings and surface and underground fixtures which cannot be so removed, and all rail, pipe, mine timbers and underground supports which have been installed and are in place. Anything not so removed within said six (6) months may not thereafter be removed without the written consent of Walker. Upon the termination of this Lease and Option for any cause, Shasta shall give to Walker originals or copies of all factual data with regard to said property, including all maps, reports, etc.

XX. NOTICES. Any notice or payment herein provided to be given or paid by Shasta to Walker shall be deemed so given or paid upon delivery thereof to Walker's office at 612 Dooly Building, Salt Lake City, Utah, or, if mailed, upon deposit thereof in a United States post office, registered mail, postage prepaid, addressed to Walker at such address. Any such payment may be made in the form of check, draft or money order, subject to being honored upon presentation. Any notice herein provided to be given by Walker to Shasta shall be deemed given to Shasta upon delivery thereof to Shasta's office at 612 Dooly Building, Salt Lake City, Utah, or, if mailed, upon deposit thereof in a United States post office, registered mail, postage prepaid, addressed to Shasta at such address. The address and location of either party to which notices or payments shall be so delivered or mailed may be changed by either party upon giving written notice to the other of such change, stating in such notice the new location and address.

XXI. SHASTA-PHELPS DODGE JOINT VENTURE. Except as hereinafter provided, neither party may assign or transfer its rights in, to or under this Lease and Option or the Mining Properties without the prior written consent of the other first had and obtained. It is understood and agreed, however, that Shasta may enter into a joint venture agreement with Phelps Dodge Corporation, a New York corporation, with respect to this

Lease and Option, and in such event all interests, rights and privileges and duties and liabilities of Shasta under this Lease and Option shall inure to the benefit of and become the obligations of the joint venture (including the parties to the joint venture agreement) and to any new corporation formed pursuant to the joint venture agreement, and Shasta may transfer, assign and convey to Phelps Dodge Corporation or to the joint venture, and the parties to said joint venture agreement, or either of them, may assign, transfer and convey to such new corporation the interests, rights and privileges of Shasta in, to and under this Lease and Option in accordance with the provisions of the joint venture agreement, provided that no such assignment to any such new corporation shall be made prior to January 1, 1958, or prior to the expenditure by Shasta of the minimum expenditure referred to and provided for in paragraph V hereof, whichever occurs first, and that such corporation shall not have any right of further assignment without the written consent of Walker being first had and obtained. The parties to said joint venture agreement, so long as the same shall be in force and effect, and the said new corporation, upon assignment of this Lease and Option to it, shall assume and be bound by the covenants and obligations, and shall be entitled to the rights and privileges of Shasta hereunder, in accordance with the provisions of the joint venture agreement.

XXII. OPERATION AND EFFECT. It is fully understood and agreed that this Lease and Option shall be of no force or effect whatsoever, and the rights, duties, powers and privileges of the parties shall be the same as though this agreement had not been executed, unless Shasta on or before August 15, 1956, shall have entered into the joint venture agreement with Phelps Dodge

Corporation relating hereto, said agreement to be in accordance with paragraph XXI of this agreement, in which event this Lease and Option shall be deemed to have become effective as of July 1, 1956, and shall cancel and supersede the Original Lease effective as of said date. It is further understood and agreed that one of the purposes of this Lease and Option is to eliminate all references contained in the Original Lease to the Agreement dated the 16th day of January, 1954, between Kay L. Stoker and Walker, and the Agreement dated the 20th day of October, 1954, between Shasta and Walker. The terms, covenants and conditions of the aforementioned agreements shall be deemed excluded from this Lease and Option and shall not, in any respect, apply to the Mining Properties or affect the rights and obligations of the parties under this Lease and Option. Said agreements dated the 16th day of January, 1954, and the 20th day of October, 1954, shall be and the same hereby are amended to eliminate therefrom any reference to the Mining Properties and in such other respects as may be necessary fully to carry out and effectuate the purpose expressed in this paragraph XXII.

XXIII. SUCCESSION. The provisions of this Lease and Option shall be binding upon and inure to the benefit of the parties hereto, their successors and assigns.

IN WITNESS WHEREOF, the parties to this Lease and Option have caused the same to be executed by their respective proper officers thereunto duly authorized, and their corporate seals to be hereunto affixed, as of the date first herein written.

WALKER ENGINEERING CORPORATION

By R. T. Walker
Its President

Attest: Ruth T. Walker
Its Secretary

SHASTA COPPER AND URANIUM COMPANY, INC.

By [illegible]
Its President

Attest: [illegible]
Its Secretary

STATE OF UTAH
COUNTY OF SALT LAKE } ss.

On this 14th day of July, A. D. 1956, before me, a Notary Public in and for the said County and State, residing therein, duly commissioned and sworn, personally appeared R. T. WALKER and BELLE T. WALKER, known to me to be the President and Secretary respectively of Walker Engineering Corporation, the corporation that executed the within instrument, and duly 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 first above written.

George M. McMillan
Notary Public
Residing at Salt Lake City, Utah

My Commission expires:
7/15/57

STATE OF UTAH
COUNTY OF SALT LAKE } ss.

On this 18th day of July, A. D. 1956, before me, a Notary Public in and for the said County and State, residing therein, duly commissioned and sworn, personally appeared K. L. STOKER and REED L. REEVE, known to me to be the President and Secretary respectively of Shasta Copper and Uranium Company, Inc., the corporation that executed the within instrument, and duly 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 first above written.

Ruth M. Gibson
Notary Public
Residing at Salt Lake City, Utah

My Commission expires:
9-1-59

EXHIBIT "A"

Properties covered by Mining Lease & Option dated January 18th, 1954

Lot No.	Description	Acres.	Mount Diablo Base & Meridian Section	Town--ship.	Range
4107	Statesman Group (11 claims) Patented 11-19-04, recorded in Vol. 9 of Patents, Pg. 36 - 53	183.77	1 12	33 N "	6 W "
	Congressman claim Democrat " Judge " Mugwump " Politician " President " Prohibitionist " Republican " Senator " Socialist " Statesman "				
3839	Shasta King Cons. Group (6 claims) Patented 8-15-02, recorded in Vol. 7 of Patents, Pg. 188 - 193	117.51	1 11 12	33 N " "	6 W " "
	Addenda Claim Grand View " Last Chance " Lookout " Shasta King " Sunny Side "				
3840	Lost Desert Cons.Group (6 claims) Patented 2-3-03, recorded in Vol. 7 of Patents, Pg. 207 - 211.	116.40	1 12	33 N "	6 W "
	Anything Claim Golden Age " June Bug " Lost Desert " Protection " Tar Flat "				
3905	Sulphide Cons.Group (6 claims) Patented 7-21-04, recorded in Vol. 7 of Patents, Pg. 330 -334.	107.10	1 12	33 N "	6 W "
	Chaparral Claim Copper " Oxide " Rosebud " Sulphide " Yellow Jacket "				

Lot No.	Description	Acres.	Mount Diablo Base & Meridian Section	Township	Range
3937	Thirteen Claims out of the Lawson Butte Cons. Group Patented 9-8-06; recorded in Vol. 11 of Patents, pg. 79 - 91 Bories claim Boston Copper " Colorado " Columbia " Comet " Interview " Marlin " Mascot " Montana " "99" " Robin " Sheep Spring " Sunshine "	258.41	23 24 25	33 N " "	6 W " "
5597	Seven Claims out of the Lawson Butte Cons. Group. Patented 6-4-23; recorded in Vol. 14 of Patents, Pg. 440 - 444. Black Oak Claim "44" " Lawson Butte " Lester " Pine Bur " Poker " Sage "	138.051	24 25	33 N "	6 W "
5595	Three Claims out of the Lawson Butte Cons. Group. Patented 6-4-23; recorded in Vol. 14 of Patents, Pg. 445 - 448. Big Buck Claim Blue Jay " Dome "	55.154	23 24	33 N "	6 W "
5569	Kit Cons. Group (5 claims) Patented 6-4-23; recorded in Vol. of Patents, Pg. B. Aus. Claim Edythe " Helen " Kit " Marg. "	76.476	6 7 1 12	33 N " " "	5 W " 6 W "

Lot No.	Description	Acres.	Mount Diablo Base & Meridian Section	Township	Range
5293	Allegheny Group (22 Claims) Patented ; recorded in Vol. of Patents; Pg.	396.519	22 23 26 27	33 N " " "	6 W " " "
	Allegheny Copper Claim				
	Alleheny Dump Extention "				
	Azurite Copper "				
	Bornite "				
	California "				
	Chalcocite "				
	Chalcopyrite "				
	Cuprite Copper "				
	Dump "				
	Geology "				
	Gossan "				
	Halite Copper "				
	Malachite "				
	Native "				
	Pennsylvania Copper "				
	Pittsburg Copper "				
	Rhyolite "				
	Roosevelt Copper "				
	San Francisco Copper "				
	Shasta Copper "				
	Sulphide "				
	Slag "				
4623	Copper Mountain Cons. Group (17 Claims) Patented ; recorded in Vol. of Patents, Pg.	300.00	25 26	33 N "	6 W "
	Boston Claim				
	Copper Mountain "				
	Cuprite "				
	Depending "				
	Geology "				
	Halite "				
	Letter "				
	Leap Year "				
	Limonite "				
	Monarch "				
	Mountain Copper "				
	Purity "				
	Redding "				
	Shasta "				
	Sugar Loaf "				
	Tehama "				
	Trinity "				
4148	Great Verde Group (4 claims) Patented 5-10-06; recorded in Vol. 11 of Patents; pg. 102.	72.50	11 12	33 N "	6 W "
	Blue Vein Claim				
	Copper Bank "				
	Great Verde "				
	Red Copper "				

Lot No.	Description	Acres.	Mount Diablo Base and Meridian Section	Township.	Range
4754	Holcomb Group (2 claims) Patented 3-21-10; recorded in Vol. 11 of Patents; Pg. 382. Dump Claim Holcomb "	22.73	11	33 N	6 W
4502	Cocktail Claim (7/9 interest) Patented 5-4-07; recorded in Vol. of Patents; Pg.	4.77	12	33 N	6 W
	Ridge Placer Mining Claim Patented 3-1-02; recorded in Vol. 7 of Patents; pg. 139 - 140 S 1/2 of S 1/2 of NE 1/4 of Sec. 29 S 1/2 of SE 1/4 of NW 1/4 of Sec. 29 (Less that portion of the above conveyed to Wm. Candrick by deed dated 6-22-02, recorded in Vol. 73 of Deeds, Pg. 210).	40.	29	33 N	6 W
	Motion Creek Placer Mining Claim Patented 3-1-02; recorded in Vol. 7 of Patents; Pg. 137 - 138. N. 1/2 of SW 1/4 of Sec. 29 NW 1/4 of SE 1/4 of Sec. 29. (Less that portion conveyed to Anna McLaughlin by deed dated 5-6-03, recorded in Vol. 79 of Deeds, Pg. 29).	95.	29	33 N	5 W
	United Placer Mining claim Patented 3-1-02; recorded in Vol. 7 of Patents; Pg. 134 - 135. S 1/2 of SW 1/4 of Sec. 29. SW 1/4 of SE 1/4 of Sec. 29. (Less that portion conveyed to Mary J. Lanyon by deed dated 6-2-02, recorded in Vol. 98 of Deeds, Pg. 108)	108.	29	33 N	5 W
	River Placer Mining Claim Patented ; recorded in Vol. of Patents; Pg. W 1/2 of NE 1/4 of SE 1/4 W 1/2 of E 1/2 of NE 1/4 of SE 1/4 (Less 43.0 acres of the above four placers, sold 7-2-46 to the Bureau of Reclamation.)	20.	29	33 N	5 W
Fee Lands in the Shasta Copper Belt, Flat Creek Mining District, Shasta County, California:					
	Township 34 North, Range 6 West Section 36. SW 1/4 N 1/2 less 40 acres deeded to F. Lowden and 20 acres deeded to Di Nola. NW 1/2 of NW 1/4 of SE 1/4.	440.	36	34 N	6 [illegible]

Fee Lands in the Shasta Copper Belt, Flat Creek Mining District, Shasta County, Calif. (Cont'd):

Description	Acres	Mount Diablo. Base & Meridian Section	Township	Range
Township 33 North, Range 5 West Section 8. S 1/2 of NE 1/4 W 1/2 of NW 1/4 S 1/2 (less 185 acres, sold 5-13-46, to the Bureau of Reclamation, as follows:	480.	8	33 N	5 W

Parcel 1. All that part of the S 1/2 of the NE 1/4 and S 1/2 of Section 8 lying on the easterly side of the line which follows the natural surface of the ground at an elevation of 1100 ft. above sea-level, hereinafter re-referred to as the 1100 ft. contour, through said Section 8 from a point in the west boundary of the E 1/2 of Section 8 on the southerly side of Squaw Creek, southerly to a point in the south boundary of Section 8, containing 179 acres.

Parcel 2. All that part of the W 1/2 of NW 1/4 of Section 8, lying on the northerly side of the 1100 ft. contour line, on the southerly side of Squaw Creek, containing 6 acres.

Unpatented Mining Claims in the Shasta Copper Belt, Shasta County, Calif.

Flat Creek Mining District.

Lot No.	Description.	Acres	Mount Diablo. Base & Meridian Section	Township	Range
4784	Skookum Cons. Group (6 claims) Surveyed for patent, but not patented.	109.94	11	33 N	6 W
	Hard Cash Claim				
	Hi Yu "				
	Last Dollar "				
	Mountain Creek "				
	Skookum "				
	Yellow Pyrite "				
4813	Potlatch Cons. Group (2 claims) Surveyed for patent, but not patented.	40.40	1	33 N	6 W
			2	"	"
			11	"	"
	Potlatch Claim		12	"	"
	R. S. Cooper "				

Backbone Mining District

Unpatented lode mining claims, situated in Section 1, Township 33 North, Range 6 West, and in Section 6, Township 33 North, Range 5 West, M.D.B. & M.

Name of the Lode Claim	Recorded 1942	Official Book	Recorded Page
Midway No. 1 mining claim	Sept. 20	85	294
Midway No. 2 " "	" 29	85	305
Midway No. 3 " "	" 20	85	[illegible]
Midway No. 4 " "	" 20	[illegible]	[illegible]
Midway No. 5 " "	" 29	85	[illegible]
Midway No. 6 " "	" 20	[illegible]	[illegible]
Midway No. 7 " "	" 20	[illegible]	[illegible]
Midway No. 8 " "	" 20	[illegible]	[illegible]
Midway No. 10 " "	" 20	[illegible]	[illegible]

Backbone Mining District (Cont'd)

Unpatented Lode Mining claims, situated in Section 1, Township 33 North, Range 6 West, and in Section 6, Township 33 North, Range 5 West, M.D. B.& M.

Name of the Lode Claim	Recorded 1942	Official Book	Records Page
**Midway No. 9 mining claim	Sept. 29	85	402
Midway No. 13 " "	Oct. 7	"	408
Midway No. 14 " "	" 7	85	406
Midway No. 15 " "	" 13	85	410
Midway No. 16 " "	" 7	85	407
Midway No. 17 " "	" 13	85	411
Midway No. 18 " "	" 14	85	413
Midway No. 19 " "	" 7	85	405
Midway No. 20 " "	" 14	85	414
Midway No. 21 " "	" 14	85	415
Midway No. 22 " "	" 13	85	412

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BOOK 300 PAGE 471

Balaklala Mining Properties

Lot No.	Description	Acres.	Section	Township	Range
3446	Balaklala Group (11 claims) patented 5/18/01, recorded in Book 7 of Patents, Page 107 -		7	33 N	5 W
	Balaklala claim		11	33 N	6 W
	Fortune "		12	"	"
	Alice "		13	"	"
	Huckleberry "		14	"	"
	El Capitan "				
	El Monte "				
	Mule "				
	Dump "				
	Feldspar "				
	Windy Camp "				
	Cleveland "				
4143	Copper Alps Group (17 claims) patented 3/1/05, recorded in Book 9 of Patents, Pg. 261		10	33 N	6 W
	Normandie claim		11	"	"
	Himalaya "		14	"	"
	Wintun "		15	"	"
	Black Metal "				
	Omega "				
	Early Bird "				
	Seaver "				
	Oro Blanco "				
	Butte "				
	Copper Alps "				
	Dewey "				
	New Eldorado "				
	Grand Prize "				
	South Fork "				
	Hobson "				
	Western "				
	Sampson "				
4145	Blenheim Group, (13 claims) patented 4/3/05, recorded in Book 9 of Patents, Pg. 298		12	33 N	6W
	Blaine claim		13	"	"
	Bryan "		14	"	"
	Jefferson "				
	Snow Slide "				
	Triangle "				
	Babe in the Woods				
	Alta "				
	Hill "				
	Cold Feet "				
	Chincapin "				
	Blenheim "				
	Last Choice "				
	Cold Stream "				
4225	Good Hope Claim, patented 4/19/05, recorded in Book 9 of Patents, page 327.		12	33 N	6 W

Lot No.	Description	Acres	Section	Township	Range
4226	Good Medicine Claim patented 4/19/05 recorded Book 9 of Patents, Pg. 322		12	33 N	6 W
4146	Cold Water Claim patented 3/1/05, recorded in Book 9 of patents, Pg. 256		14	33 N	6 W
4144	McKinley Group (19 claims) patented 7/28/05, recorded book 9 of Patents, Pg. 456		12	33 N	6 W
			13	"	"
			7	33 N	5 W
	McKenzie		8	"	"
	Frozen North		17	"	"
	Copley		18	"	"
	Spring Gulch				
	Pony				
	Ruby				
	Jasper				
	Big Chief				
	Blue Jay				
	Sunny South				
	Cold Spring				
	Trail				
	Iron Cap				
	McKinley				
	Garnet				
	Rain Crow				
	Lucky Boy				
	White Grouse				
	Emma Star				
4502	Cocktail Claim (2/9 int) patented May 4, 1907, Recorded Book 11 of Patents, Page 166		12	33 N	6 W
4501	Rocky Gulch Group (2 claims) patented 4/27/08, recorded book 11, page 240.				
	Rocky Gulch				
	Creek				
4599	Indiana Group (4 claims) patented 4/27/08, recorded book 11 of patents, page 243.		19	33 N	5 W
			20	"	"
			29	"	"
	Indiana		30	"	"
	Last Chance				
	Sunrise				
	Bay State				
4244	1/3 Int. in Sheridan Group, patented 4/03/05, recorded in book 9 of Patents, Page 421 (3 claims)		14	33 N	6 W
	Phil Sheridan				
	US Grant				
	W T Sherman				
4807	Hillside Claim, patented 2/24/13 recorded book 11 of Patents, Pg. 602		12	33 N	6 W

Unpatented lode claims located in the West Shasta Copper Belt subsequent to January 18th, 1954:

EMPIRE GROUP - Sections 10, 11, T33N R6W MDM, Shasta County, California

Name	District	Locator	Loc. Date	Rec. Date	Bk.	Pge.
Empire No. 1	Flat Creek	Walker Eng. Co.	8/25/55	11/22/55	477	86
" No. 2	"	"	8/26/55	11/22/55	477	88
" No. 3	"	"	8/27/55	11/22/55	477	90
" No. 4	"	"	2/10/56	3/22/56	488	61
" No. 5	"	"	2/10/56	3/22/56	488	63
" No. 6	"	"	2/14/56	3/22/56	488	65
" No. 7	"	"	2/16/56	3/22/56	488	67
" No. 8	"	"	2/20/56	3/22/56	488	69
" No. 9	"	"	2/20/56	3/22/56	488	71
" No. 10	"	"	3/15/56	3/22/56	488	73
" No. 11	"	"	3/18/56	3/22/56	488	75

GAP GROUP - Sections 23 & 24, T 33 N, R 6 W, MDM, Shasta County, California

There have been fourteen claims located in this group, principally during May and June, 1956. The location work has been done on 1 through 10, inclusive, but not on 11 through 14, inclusive. The locations have not yet been recorded so we do not have the data on them.

EXHIBIT C TO LEASE AND OPTION

NOTICE

"Pursuant to the California Code of Civil Procedure, Section 1192, notice is hereby given that Walker Engineering Corporation is the owner of the following described properties (insert here a description of the Mining Properties) and that said corporation does hereby give notice that it will not be responsible for any construction, alteration or repairs upon any of said property for any work performed or labor done or materials furnished on said property, and that said property is subject to a certain Lease and Option between said Walker Engineering Corporation and Shasta Copper and Uranium Company, Inc., dated as of the ____ day of _____, 1956, and recorded in the office of the County Recorder, Shasta County, California as of the _____ day of _____, 1956, and that said property will not be subject to any liens as a result of the operations of said Shasta Copper and Uranium Company, Inc. or any assignee thereof."

RECORDED AT REQUEST OF
Fabian Clendenin Moffat & Mabey
AT 15 MIN. PAST 9 A M
OFFICIAL RECORDS SHASTA COUNTY, CALIF.
AUG 6 1956
Volume 501-Page 447
Michael Montgomery
RECORDER FEE $ 2.00 pd.

Betty -
Attach our COL to
Contract & give,
Audit theirs.

OFFICIAL FILE COPY
DMEA
RECEIVED JUL 15 1957

DATE	INITIALS	CODE

MF-205
(Combines and supercedes MF-201 and MF-203)
June 1958

RECEIVED
MAY 14 1958
D.M.E.A.

Government's copy
For Government's Use Only

EXPLORATION PROJECT CONTRACT
Operator
Docket No. DMEA- 4786
Contract No. Idm-E 1189
Contract Date 2 MAY 1958

CONSENT TO LIEN
and
SUBORDINATION AGREEMENT 1/

To the United States of America:

Referring to that certain land in the County of SHASTA, State of CALIFORNIA, described as follows: 2/

SEE ATTACHED SHEET

, which is the subject of a proposed exploration project contract, hereinafter called the "contract," with the United States of America, hereinafter called the "Government;" in consideration of the contract and as an inducement to the Government to enter into it, the undersigned hereby--

1. 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;

2. Grants to the Government a lien upon all of the undersigned's right, title, and interest in the land and upon any production of minerals therefrom, to secure the payment to the Government of a percentage royalty on production as may be provided for by the Contract;

3. Subordinates the undersigned's right, title, claim, or interest 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. 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 lines blank.)

NONE

1/ Mining or 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 cannot be dispensed with. If the space provided is insufficient, use an Annex, and refer to the Annex in the space.

5. 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 copies of such notice; and

6. 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.

7. Added provision: NONE (State "None" or "See Annex No.____")

Dated this 2nd day of MAY, 1958.

WALKER ENGINEERING CORPORATION	[Seal]	Box 857, Redding, Cal	[Address]
By Woodville J. Walker Woodville J. Walker, President	[Seal]	Box 857, Redding, Calif	[Address]
	[Seal]		[Address]
By Belle T. Walker Belle T. Walker, Secretary	[Seal]	Box 857, Redding, Calif	[Address]
	[Seal]		[Address]
	[Seal]		[Address]

I, Belle T. Walker certify that I am the Secretary (Secretary, etc.) of the corporation named herein; that Woodville J. Walker who signed this agreement was then President (President or Vice-President, 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.

Walker Engineering Corporation
[Corporate Seal]

PROPERTY SUBORDINATED WITH SUGAR LOAF DMEA APPLICATION

Patented and unpatented mining claims situated in Sections 23, 24, 25 and 26, Township 33 North, Range 6 West, M.D.M.

LAWSON BUTTE CONS. GROUP (part): Patent No. 5597

Black Oak	Lester	Poker	Lawson Butte
"44"	Pine Bur	Sage	

ALLEGHANY GROUP: Patent No. 5293

Alleghany Copper	Geology Copper	Roosevelt Copper
Azurite Copper	Gossan Copper	San Francisco Copper
Bornite Copper	Halite Copper	Shasta Copper
California Copper	Malachite Copper	Sulphide Copper
Chalcocite Copper	Native Copper	Slag Copper
Chalcopyrite Copper	Pennsylvania Copper	Limonite Copper
Cuprite Copper	Pittsburg Copper	
Dump Copper	Rhyolite Copper	

COPPER MOUNTAIN CONS. GROUP: Patent No. 4623

Boston Copper	Letter	Shasta Copper
Copper Mountain	Leap Year Copper	Sugar Loaf Copper
Cuprite	Limonite	Tehama Copper
Depending	Monarch Copper	Trinity Copper
Geology Copper	Purity	
Halite	Redding Copper	

LAWSON BUTTE CONS. GROUP (part): Patent No. 5595

Big Buck	Blue Jay	Dome

LAWSON BUTTE CONS. GROUP (part): Patent No. 3937

Bories	Comet	Montana	Sunshine
BBston Copper	Interview	"99"	
Colorado	Marlin	Robin	
Columbia	Madcot	Sheep Spring	

GAP GROUP OF UNPATENTED MINING CLAIMS.

	Book	Page	Amended Location Book	Amended Location Page
Gap No. 1	498	266		
Gap No. 2	498	268		
Gap No. 3	498	270		
Gap No. 4	498	272		
Gap No. 5	498	274	518	96
Gap No. 6	498	276		
Gap No. 7	498	278		
Gap No. 8	498	280		
Gap No. 9	498	282		
Gap No. 10	498	284		
Gap No. 11	510	240	518	98
Gap No. 12	518	100		
Gap No. 13	518	102		
Gap No. 14	510	242	518	104

MF-205
(Combines and supercedes MF-201 and MF-203)
June 1956

Audit's copy
For Government's Use Only
EXPLORATION PROJECT CONTRACT
Operator
Docket No. DMEA- 4786
Contract No. Idm-E 1189
Contract Date 2 MAY 1958

RECEIVED
MAY 14 1958
D.M.E.A.

CONSENT TO LIEN
and
SUBORDINATION AGREEMENT 1/

To the United States of America:

Referring to that certain land in the County of SHASTA, State of CALIFORNIA, described as follows: 2/

SEE ATTACHED SHEET

which is the subject of a proposed exploration project contract, hereinafter called the "contract," with the United States of America, hereinafter called the "Government;" in consideration of the contract and as an inducement to the Government to enter into it, the undersigned hereby--

1. 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;

2. Grants to the Government a lien upon all of the undersigned's right, title, and interest in the land and upon any production of minerals therefrom, to secure the payment to the Government of a percentage royalty on production as may be provided for by the Contract;

3. Subordinates the undersigned's right, title, claim, or interest 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. 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 lines blank.)

NONE

1/ Mining or 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 cannot be dispensed with. If the space provided is insufficient, use an Annex, and refer to the Annex in the space.

5. 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 copies of such notice; and

6. 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.

7. Added provision: NONE (State "None" or "See Annex No.____")

Dated this 2nd day of MAY, 1958.

WALKER ENGINEERING CORPORATION	[Seal]	Box 857, Redding, Calif.	[Address]
By Woodville J. Walker Woodville J. Walker, President	[Seal]	Box 857, Redding, Calif	[Address]
By Delle T. Walker Delle T. Walker, Secretary	[Seal]	Box 857, Redding, Calif	[Address]
	[Seal]		[Address]
	[Seal]		[Address]
	[Seal]		[Address]

I, Delle T. Walker certify that I am the Secretary (Secretary, etc.) of the corporation named herein; that Woodville J. Walker who signed this agreement was then President (President or Vice-President, 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.

Walker Engineering Corporation
[Corporate Seal]

PROPERTIES SUBORDINATED WITH SUGAR LOAF DM APPLICATION

Patented and unpatented mining claims situated in Sections 23, 24, 25 and 26, Township 33 North, Range 6 West, M.D.M.

LAWSON BUTTE CONS. GROUP (part): Patent No. 5597

Black Oak	Lester	Poker	Lawson Butte
"44"	Pine Bur	Sage	

ALLEGHANY GROUP: Patent No. 5293

Alleghany Copper	Geology Copper	Roosevelt Copper
Azurite Copper	Gossan Copper	San Francisco Copper
Bornite Copper	Halite Copper	Shasta Copper
California Copper	Malachite Copper	Sulphide Copper
Chalcocite Copper	Native Copper	Slag Copper
Chalcopyrite Copper	Pennsylvania Copper	Limonite Copper
Cuprite Copper	Pittsburg Copper	
Dump Copper	Rhyolite Copper	

COPPER MOUNTAIN CONS. GROUP: Patent No. 4623

Boston Copper	Letter	Shasta Copper
Copper Mountain	Leap Year Copper	Sugar Loaf Copper
Cuprite	Limonite	Tehama Copper
Depending	Monarch Copper	Trinity Copper
Geology Copper	Purity	
Halite	Redding Copper	

LAWSON BUTTE CONS. GROUP (part): Patent No. 3595

Big Buck	Blue Jay	Dome

LAWSON BUTTE CONS. GROUP (part): Patent No. 3937

Bories	Comet	Montana	Sunshine
Boston Copper	Interview	"99"	
Colorado	Marlin	Robin	
Columbia	Modest	Sheep Spring	

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Gap No. 12	518	100		
Gap No. 13	518	102		
Gap No. 14	510	242	518	104

Extra copy

MF-200
(Revised June 1954)

Docket No. DMEA 4786

Commodity copper, zinc

Contract No. Idm-E 1189

UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

EXPLORATION PROJECT CONTRACT[1]

It is agreed this 2 MAY 1958 day of ....., 195...., between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, hereinafter called the "Government," and [2] Shasta-Phelps Dodge Joint Venture (Phelps Dodge Corporation, a New York corporation and Shasta Minerals & Chemical Co., a Nevada corporation),
whose mailing address is P. O. Box 857
Redding, California,
hereinafter called the "Operator," as follows:

ARTICLE 1. *This contract* is entered into under the authority of the Defense Production Act of 1950, as amended. It consists of this form (MF-200), the attached Exhibit "A," Annex I, and two maps

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

ARTICLE 2. *Operator's property rights.*—(a) The land which is the subject of this contract (hereinafter called "the land") is in the State of California, County of Shasta, and is described in Annex I.[3]

(b) The Operator represents and undertakes that:

(1) The Operator is the [4] lessee-optionee of [5] the entire interest in the land, in possession and entitled to possession for all of the purposes of this contract, under and by virtue of a [6] lease and option, [7] ....recorded in Book ....., page ....., official records of said County; and

(2) The Operator's right, title, or interest (whether as owner, lessee, or otherwise) is subject only to the following claims, liens, or encumbrances: Royalty of 2½% of gross income payable to lessor.

(c) 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 Consent to Lien of any holder of the legal title

[1] If sufficient space is not provided in any blank, use an extra sheet of paper and refer to it in the blank.
[2] Insert name, and if an organization, its nature (corporation and place of incorporation, partnership with names of partners, etc.).
[3] State on a separate sheet marked "Annex I" the legal description or enough to identify the property, particularly excluding any areas from which the production is not to be subject to the Government's percentage royalty.
[4] Insert "owner," "lessee," "contract purchaser," "locator," etc.
[5] Insert "the entire interest," "the mineral rights," "an undivided one-third," etc.
[6] Insert "deed," "lease," "contract," "location notice," "patent," etc.
[7] If not recorded, so indicate by inserting "un."

of the land (lessor, seller, optionor, etc.), are attached, as follows: Consent to Lien and Subordination Agreement executed by the Walker Engineering Corporation.

(d) The Operator shall preserve and maintain his right, title, and 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. Until the lapse of the time within which the Government may make a certification of discovery or development without any such certification having been made, and after any such certification has been made, 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 percentage royalty on production and lien for the payment thereof. If the Government makes no certification of discovery or development within the time limited in Article 8, it shall thereafter have no claim against the land or any production therefrom except for any production referred to in Article 8(b)(1).

ARTICLE 3. *The exploration project.*—The project is a search for indicated or undeveloped deposits of copper and zinc. The work to be performed is described in Exhibit "A." The Operator on or before ..... shall commence the work, and on or before 2 years from date (unless the Operator's obligation to prosecute the work is terminated—see Article 10) shall either have completed the work or shall have incurred allowable costs (see Article 6) in a sum not less than the estimated total allowable cost set forth in Exhibit "A," except as provided in Exhibit "A" with respect to Stages of work. See Article 13.

ARTICLE 4. *Performance of the work.*—(a) *Operator's responsibility.*—The work shall be performed with reasonable diligence, efficiently, expertly, in a workmanlike manner, in accordance with good mining standards and State regulations for health and safety and for liability insurance covering employment; and with suitable and adequate equipment, facilities, materials, supplies, and labor, to bring it to completion within the time fixed.

(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; but if the reference in Exhibit "A" to any such independent contract requires the Government's approval thereof, payments under such contract will not be allowable costs unless the Government gives its written approval of the contract. 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 and regardless of the Government's approval thereof, the Government will participate in payments to the independent contractor only on account of work performed in accordance with the provisions of this exploration project 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 also after a certification of discovery or development to inspect production operations and underground workings. The operator shall provide the Government with all reasonable means of access for such inspections.

ARTICLE 5. *Contribution by the Government.*—The estimated total allowable cost of the project, set forth in Exhibit "A," is the sum of $ 180,170.00. The Government shall contribute 50 percent of the allowable costs as they are incurred in a total sum not in excess of $ 90,085.00: *Provided,* That until the Operator has rendered to the Government his final report, and any final auditing required by the Government has been made, and a final settlement of the contract has been made, the Government may withhold from the last

voucher or vouchers such sums as it sees fit not in excess of 10 percent of the estimated total cost of the work or not in excess of the amount of the Government's contribution to the cost of property which is or may become subject to disposal as provided in Article 9(c), whichever is greater. The Government will make its contribution on the basis of the monthly vouchers referred to in Article 7(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. "Costs incurred" mean costs that have been paid or have become due and payable, or that in the opinion of the Government have become an obligation. The Government may make payments directly to independent contractors and suppliers for the account of the Operator rather than to the Operator.

ARTICLE 6. *Estimated costs.*—(a) *Categories of costs.*—The allowable costs of the work to which the Government shall contribute are limited to those that are direct, reasonable, necessary, and that are estimated in Exhibit "A" by categories as specified in this article. If any category or subcategory is omitted from the estimate of costs, or if the word "none" is annexed to the listing thereof, costs under such category or subcategory are not allowable. Any excess over any estimate which is indicated as the maximum of any category, subcategory, or item, either as to requirement or related cost, and any excess over the estimated total allowable cost of the work, shall not be allowable. Any excess over the estimate of any category, subcategory, or item, either as to requirement or related cost, not indicated as a maximum shall be allowable within the limit of the estimated total allowable cost of the work. To the extent that excesses over maximums other than the estimated total allowable cost of the work may be necessary for the performance of the work, the Operator shall incur such excesses for his own account without contribution by the Government; but except for any such necessary excesses in categories, subcategories, or items thereunder the Operator is not obligated to incur more than his agreed percentage of the estimated, total allowable cost of the work.

To the extent specified in this article or in Exhibit "A" the following categories, subcategories, and elements thereof are maximums; but if not so specified either here or in Exhibit "A" they are not maximums, and may be exceeded within the limit of the estimated total allowable cost of the work:

CATEGORY (1)—INDEPENDENT CONTRACTS.—Work to be performed under independent contracts (see Article 4(b)). The estimated total amount of this category and the estimated cost of each unit of work for performance under an independent contract are maximums.

CATEGORY (2)—PERSONAL SERVICES.

Subcategory (a)—Supervision.—All elements of this subcategory (number of supervisors, periods of employment, rates of pay, and total) are maximums.

Subcategory (b)—Technical services.—All elements of this subcategory (number of technicians, periods of employment, rates of pay, and total) are maximums.

Subcategory (c)—Labor.

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

CATEGORY (4)—OPERATING EQUIPMENT.

Subcategory (a)—Rental.—The number of each object to be rented [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 estimated 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.—Estimates under this category include all requirements and related costs, 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 estimated total of this category is a maximum.

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

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

CATEGORY (6)—NEW BUILDINGS, FIXTURES, AND INSTALLATIONS (EXCLUSIVE OF MINE WORKINGS).—Estimates under this category include all requirements and related costs, 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 estimated total of this category is a maximum.

CATEGORY (7)—MISCELLANEOUS.—Repairs and maintenance (other than initial) of operating equipment, analytical work, prints and other reproductions, accounting, Operator's share of payroll taxes, liability insurance covering employment, travel, communications, and any other items of requirement or cost that do not fall within any of the first 6 categories.

THE ESTIMATED TOTAL ALLOWABLE COST of the work is a maximum.

(b) *Nonallowable costs.*—The following costs are not allowable for contribution by the Government:

(1) *Costs of the land,* such as rental, depreciation, depletion, or other cost 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 estimated total cost. This provision does not apply to receipts from production which are subject to the Government's percentage royalty under the provisions of Article 9.

See Article 13.

ARTICLE 7. *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. If the Government elects to audit said records and accounts relating to the exploration work by certified public accountant, it may do so as a cost of the work to which the Operator shall contribute. 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 any pertinent books, documents, papers, and records of the Operator. All of the Operator's vouchers and records and accounts relating thereto and the Government's payments thereof remain subject to adjustment until final audit by the Government. 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) *Progress reports and vouchers.*—The Operator shall provide the Government with five copies of monthly progress reports in three sections as follows: (1) Operator's Monthly Report and Voucher showing detailed costs incurred during the reporting period; (2) Operator's Unit Cost and Progress Report showing the various types of work performed during the reporting period and costs incurred for each type of work; 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.)

(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 five copies of a final report (in addition to the final progress report and voucher). 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 related costs incurred.

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

(e) *Compliance with requirements.*—If in the opinion of the Government 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 making or completion of such 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 8. *Repayment by Operator.*—(a) *Certification.*—If the Government considers that a discovery or development from which production may be made has resulted from the work, the Government, at any time not later than six months after a sufficient final report and final account (see Article 7) has been rendered, may so certify in writing to the Operator. Such certification shall describe broadly or indicate the nature of the discovery or development.

(b) *Royalty on production.*—The Operator, as principal if the Operator is the producer, or as surety if the Operator is not the producer, shall pay to the Government a royalty on all minerals mined or produced from the land, as follows: (1) regardless of any certification of discovery or development, from the date of the contract until the lapse of the time within which the Government may make such certification, or until the total net amount contributed by the Government without interest is fully repaid, whichever occurs first; or (2) if the Government makes a certification of discovery or development, within a period of ten years from the date of the contract, or until the total net amount contributed by the Government without interest is fully repaid, whichever occurs first.

(c) *Basis for computation.*—The Government's royalty shall be a percentage of the gross proceeds (including any bonuses, premiums, allowances, or other benefits) from the production sold, in the form sold (ore, concentrates, 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, on account of the cost of treatment processes performed by *the buyer,* sampling and assaying to determine the value of the production sold, and freight paid by *the buyer* to a carrier (not the Operator), shall be allowed as deductions in arriving at the "gross proceeds" as that term is used herein. Any costs of treatment processes, sampling or assaying, or transportation, performed or paid by the Operator or by anyone other than the buyer, are not deductible in arriving at the "gross proceeds" as that term is here used. The term "treatment processes," as here used, means those processes (such as milling, concentrating, smelting, refining, or equivalent) applied to the crude ore or other production after it is extracted from the ground, to put it into a commercially marketable form; excluding fabricating or manufacturing.

(d) *Unsold production.*—If any production (ore, concentrates, metal, or equivalent), after the lapse of six months from the date the ore was extracted from the ground, remains neither sold nor used by the Operator 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, concentrates, metal, or equivalent) it is in when the Government elects to require computation and payment. If any production is used by the Operator 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 therof in the form in which and at the time when 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) *Percentages of royalty.*—The percentages of the Government's royalty shall be as follows:

One and one-half (1½) percent of amounts ("gross proceeds" or "value") not in excess of eight dollars ($8.00) per ton of production in the form in which sold, held, or used, plus one-half (½)

percent for each additional full fifty cents ($0.50) by which such amounts exceed eight dollars ($8.00) per ton, but not in excess of five (5) percent of such amounts.

(For instance: the royalty on an amount of five dollars ($5.00) per ton would be one and one-half (1½) percent; on an amount of ten dollars ($10.00) per ton, three and one-half (3½) percent.)

(f) *Time for computation and payment.*—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, as above provided in this article.

(g) *Lien for payment.*—To secure the payment of its percentage royalty, there is hereby granted to the Government a lien upon the land or the Operator's interest in the land and upon any production of minerals therefrom, until the royalty claim is extinguished by lapse of time or is fully paid.

(h) *Notice to purchasers.*—The Operator 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 Administrator, Defense Minerals Exploration Administration, or his successor, and his estimate thereof shall be final and binding upon the Operator.

(i) *No obligation to produce.*—Nothing in this contract is to be construed as imposing any obligation on the Operator or the Operator's successor in interest to engage in any production operations.

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

ARTICLE 9. *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, any reasonable and necessary costs thereof to be treated as an allowable cost of the project. After the completion of the work or termination of the Government's obligation to contribute, or when such property is not in use for or needed for the work, the Operator shall neither use it without the written consent of the Government nor without paying a reasonable rental to be fixed by the Government for its interest.

(c) *Disposal of property.*—Upon the completion of the work or 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, by sale to others, or purchase by the Operator or 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 the cost of which was more than $500, and shall not sell at less than 25 percent of the purchase price any item of property which 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 himself cares to give. Property remaining upon any termination of the work shall be considered in groups or categories (such as drill steel, or explosives, or pipe, or rails), 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 project.

(d) *Default of the Operator re disposal.*—If within 90 days after the completion of the work or termination of the Government's obligation to contribute to costs, or after the property is no longer needed for the work, or after such further time as the Government may in writing allow, 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 pursue one of the following two courses: (1) the Government, by written notice to the Operator, may place upon such property what in its opinion is 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; or (2) the Government may 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 10. *Termination of the Government's obligations.*—(a) If in the opinion of the Government operations at any time have failed to achieve anticipated results that indicate the probability of making a worthwhile discovery, and in the opinion of the Government further operations are 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 winding up, reporting, and accounting; and (2) the Operator shall be free of all obligation to prosecute the work other than such as may be necessary and incidental to winding up, reporting, and accounting.

(b) If in the opinion of the Government the Operator is in any manner 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 winding up, reporting, and accounting; and (2) the Operator shall be free of all obligation to prosecute the work other than such as may be necessary and incidental to winding up, reporting, and accounting. The remedy provided for the Government in this paragraph "(b)" is in addition to any other remedy provided in this contract, and in addition to any other remedy the law may provide for breach of contract.

(c) The giving of any notice by the Government under the provisions of this Article 10 shall not affect the Government's rights as provided for in the contract with respect to a percentage royalty, and such rights shall be fully preserved.

ARTICLE 11. *Notices to be given by the Government* may be delivered to the Operator, or may be sent by registered 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 12. *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 13. *Changes and added provisions.*—

(a) In the last sentence of Article 3 after the words "Exhibit 'A'" the period is changed to a comma and the following is added: "except as provided in Exhibit "A" with respect to Stages of work.

(b) In the last sentence of Article 6(c), the words "Article 8" are substituted for the words "Article 9".

(c) Notwithstanding any other provisions of the Contract, the allowable unit costs per foot of a drilling item is the average unit cost per foot computed on the basis of all the actual unit costs of said drilling item incurred by the Operator: Provided, That the Government will not contribute to any portion of an average unit cost of a drilling item that exceeds the estimated unit cost of said item set forth in the contract.

Executed in sextuplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By C. O. Mittendorf

Administrator, Defense Minerals Exploration Administration

SHASTA-PHELPS DODGE JOINT VENTURE
(Operator)
XXXXX

By .....

Title .....

I, ..., certify that I am the ..... secretary of the corporation named as Operator herein; that ..... who signed this contract on behalf of the Operator, was then ..... of said corporation; that said contract was duly signed for and in behalf of said corporation by authority of its governing body, and is within the scope of its corporate powers.

.....

[CORPORATE SEAL]

U. S. GOVERNMENT PRINTING OFFICE 16—70617-1

EXPLORATION PROJECT CONTRACT
SHASTA-PHELPS DODGE JOINT VENTURE
DOCKET NO. DMEA-4786

ANNEX I

The property referred to in Article 2 consists of sixty-one patented and fourteen unpatented lode mining claims, hereinafter listed, all situate in secs. 23, 24, 25 and 26, T. 33 N., R. 6 W., M.D.M., Shasta County, California. The claims are shown on the attached map entitled "Figure 1 - DMEA 4786".

Patented Claims

LAWSON BUTTE CONS GROUP (part): Patent No. 5597

Black Oak	Lester	Poker
"AA"	Pine Bur	Sage
Lawson Butte		

ALLEGHANY GROUP: Patent No. 5893

Allegheny Copper	Geology Copper	Roosevelt Copper
Azurite Copper	Gossan Copper	San Francisco Copper
Bornite Copper	Halite Copper	Shasta Copper
California Copper	Malachite Copper	Sulphide Copper
Chalcocite Copper	Native Copper	Slag Copper
Chalcopyrite Copper	Pennsylvania Copper	
Cuprite Copper	Pittsburgh Copper	Limonite Copper
Dump Copper	Rhyolite Copper	

COPPER MOUNTAIN CONS GROUP: Patent No. 4083

Boston Copper	Letter	Shasta Copper
Copper Mountain	Leap Year Copper	Sugar Leaf Copper
Cuprite	Limonite	Tehama Copper
Depending	Monarch Copper	Trinity Copper
Geology Copper	Purity	
Halite	Redding Copper	

LAWSON BUTTE CONS GROUP (part): Patent No. 5595

Big Buck	Blue Jay	Dome

LAWSON BUTTE GOSS GROUP (part): Patent No. 3537

Bories	Comet	Montana	Sunshine
Boston Copper	Interview	"99"	
Colorado	Marlin	Robin	
Columbia	Mascot	Sheep Spring	

Unpatented Claims

GAP GROUP OF UNPATENTED MINING CLAIMS

Name	Book	Page	Am. Loc.	Recorded
Gap No. 1	498	266		
Gap No. 2	498	268		
Gap No. 3	498	270		
Gap No. 4	498	272		
Gap No. 5	498	274	12/21/56	518-96
Gap No. 6	498	276		
Gap No. 7	498	278		
Gap No. 8	498	280		
Gap No. 9	498	282		
Gap No. 10	498	284		
Gap No. 11	510	240	12/20/56	518-98
Gap No. 12	518	100		
Gap No. 13	518	102		
Gap No. 14	510	242	12/19/56	518-104

The Operator is in possession of the claims pursuant to the provisions of a Lease and Option agreement executed July 1, 1956, by the Walker Engineering Corporation, the owner of the claims.

The Patents and Notices of Location of all the above claims, to which reference is hereby made for a more complete description, are recorded in the official records of Shasta County, California.

A Consent to Lien and Subordination Agreement executed by the Walker Engineering Corporation, is attached and made a part hereof.

EXPLORATION PROJECT CONTRACT
SHASTA-PHELPS DODGE JOINT VENTURE
DOCKET NO. IMSA-4786

EXHIBIT "A"

General Provisions

The purpose of the project is to explore for ores of copper and zinc by diamond core drilling for a maximum of 17,440 feet in the Sugar Leaf area, of the West Shasta district, Shasta County, California.

All diamond drilling shall be performed with AX size, or larger coring bits and all drill core shall be made available to the Government for examination. All significantly mineralized core, in lengths not to exceed 5 feet, shall be split and one half thereof sampled and assayed for copper and zinc.

Sludges corresponding to the cores shall be taken, if possible, and in the event that core recovery does not exceed 70% both core and sludge samples will be taken at intervals not to exceed 5 feet. Both the core and sludge samples shall be split, and one half thereof properly sampled and assayed. The remaining half of all significantly mineralized core and sludge samples shall be made available to the Government.

The work is divided into two Stages. The Operator will perform the Stage I work, and in the event significant copper mineralization is discovered as a result of the Stage I work, the Operator will perform as much of Stage II work as is approved in advance by the Government. It is estimated that twenty thousand feet of access road construction will be required to facilitate the diamond drilling.

Stage I

Diamond drill four holes aggregating not in excess of 4,350 feet. It is estimated that 5,000 feet of access road will be required in this Stage.

The tentative hole locations are shown on the attached map entitled "Exhibit C" but the actual locations,

of such holes, are subject to prior Government approval. At least two of the holes shall be drilled to angle to the southeast.

Stage II

Diamond drill approximately sixteen holes aggregating not in excess of 13,000 feet. It is estimated that 15,000 feet of access road will be required for this Stage.

The locations of the drill holes are contingent upon the results of Stage I drilling and are subject to prior Government approval. At least half of all holes drilled in Stage II shall be angled holes.

Estimated Costs of the Project

Stage I

Category (1) Independent Contracts

4,360 feet of diamond drilling @ $8.25/ft.	$ 35,970.00

Includes all drilling costs, such as reaming and casing, cementing and redrilling, surveys, delays, etc. and all other costs for which no schedules appear below.

Category (2) Personal Services

(a) and (b) Supervision and Technical Services

1 Supervisor-drill foreman 4 months @ $600.00/month	$2,400.00	
1 Geologist, 4 months @ $550.00/month	2,200.00	$ 4,600.00

Category (3) Operating Materials and Supplies

175 paper core boxes @ $1.25/each	$ 218.75

Gasoline and oil for water pump, 4 months @ $190.00/monthly	$ 760.00	
4,000 feet one inch black iron pipe, with couplings	547.00	
Miscellaneous supplies	250.00	
Gasoline, oil and grease for truck, 4 months @ $50.00/month	200.00	
		$ 1,973.75

Category (4) Sampling Equipment

(a) Depreciation

Pick-up truck, value	$2,400.00	
Duplex pump, 300 lb. pressure, 50 GPM	3,100.00	
	$5,500.00	
$93.00 monthly, 4 months		372.00

Category (5) None

Category (6) New Buildings, installations

1 Butler steel building, size 8x10 feet with cure racks	$1,000.00	
5,000 feet access roads at $0.50/ft.	2,500.00	
		$ 3,500.00

Category (7) Miscellaneous

100 samples for assay @ $1.50/sample	150.00	
Repair and maintenance of truck and pumps, etc. $50.00 monthly, 4 months	200.00	

Payroll taxes, insurance, etc. 4 months @ $100.00/month	$ 400.00	
Accounting and contingencies	250.00	$ 1,[illegible]
Estimated Total Cost of Stage I		$ 87,417.75

Stage II

Category (1) Independent Contracts

13,[illegible] feet of diamond drilling @ $[illegible].25/foot		$187,[illegible]

Includes all drilling costs, such as running and casing, cementing and redrilling, surveys, delays, etc. and all other costs for which no schedules appear below.

Category (2) Personal Services

(a) and (b) Supervision and Technical Services

1 Supervisor-drill foreman 12 months @ $[illegible].00/month	$7,[illegible]	
1 Engineer, 12 months @ $[illegible].00/month (one fourth time)	1,[illegible]	
		$ 8,[illegible]

Category (3) Operating Materials and Supplies

400 paper core boxes @ $1.35 each	$ 540.00	
Gasoline and oil for water pump 12 months @ $190.00/monthly	2,280.00	
Gasoline, oil and grease for truck, 12 months @ $50.00/month	600.00	
		$ 3,[illegible]

Category (4) Sampling Equipment

(a) Depreciation

Pick-up truck value $2,[illegible].00

Engler pump, 500 lb. 3,[illegible].00
pressure, 50 GPM

$5,[illegible].00

$93.00/month, 12 months $ 1,116.00

Category (5) None

Category (6) New Buildings, Installations

1 Butler steel building, $ 1,[illegible].00
size 8x12 feet with
one room

15,000 feet access road @ 7,[illegible].00 8,[illegible].00
$0.50/ft.

Category (7) Miscellaneous

300 samples for assay at 450.00
$1.50/sample

Repair and maintenance of 600.00
truck, and pump, etc.
$50.00/month, 12 months

Payroll taxes, insurance, etc. 1,200.00
12 months @ $100.00/month

Accounting and contingencies 736.25 2,[illegible].25

Estimated total cost of Stage II $132,[illegible].25

Estimated Total Costs of Stage I $ 47,417.75

Estimated Total Costs of Stage II 132,[illegible].25

Estimated Total Cost of the Project	$150,170.00
Government's participation @ 50%	$ 90,000.00

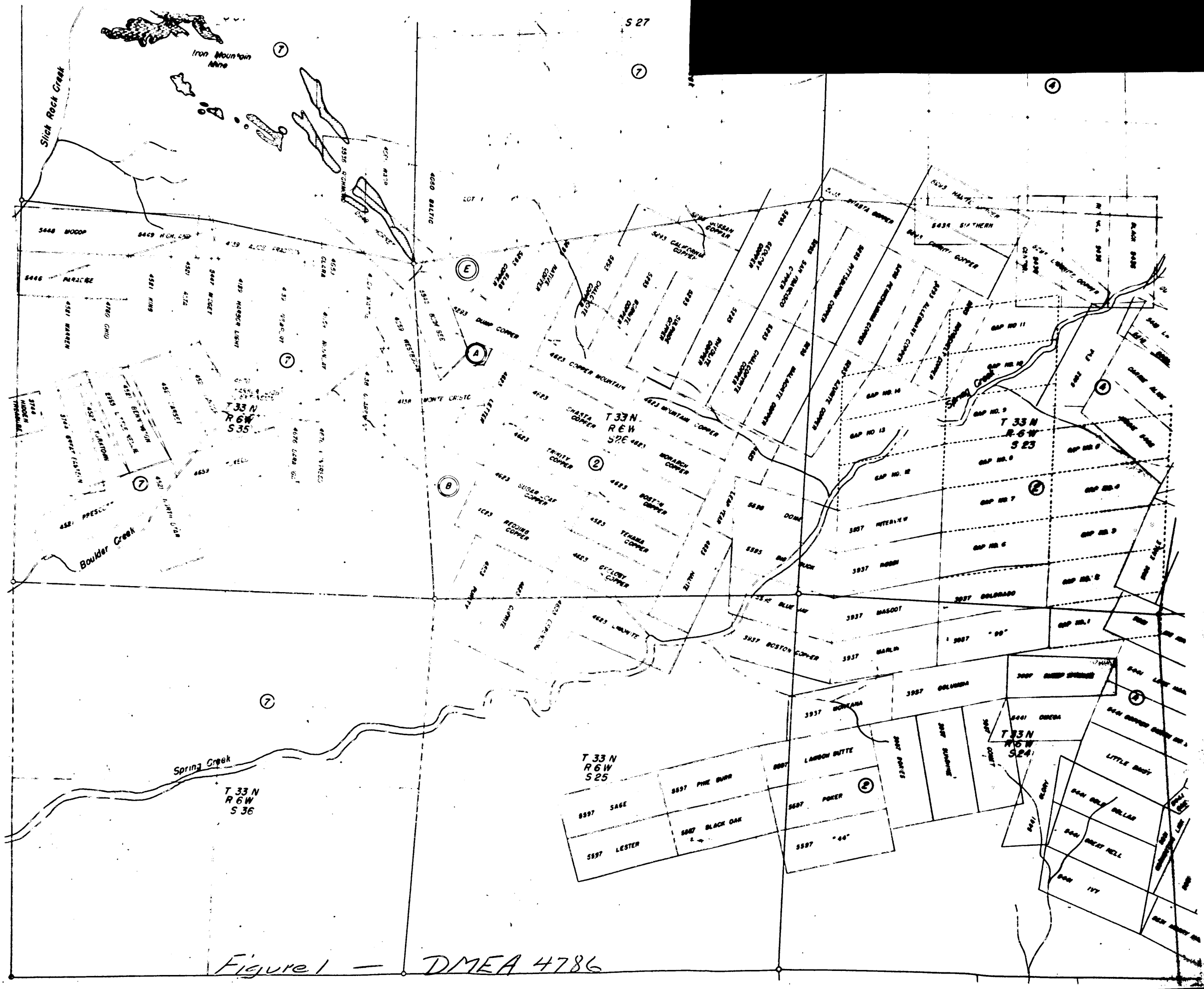

Figure 1 — DMEA 4786

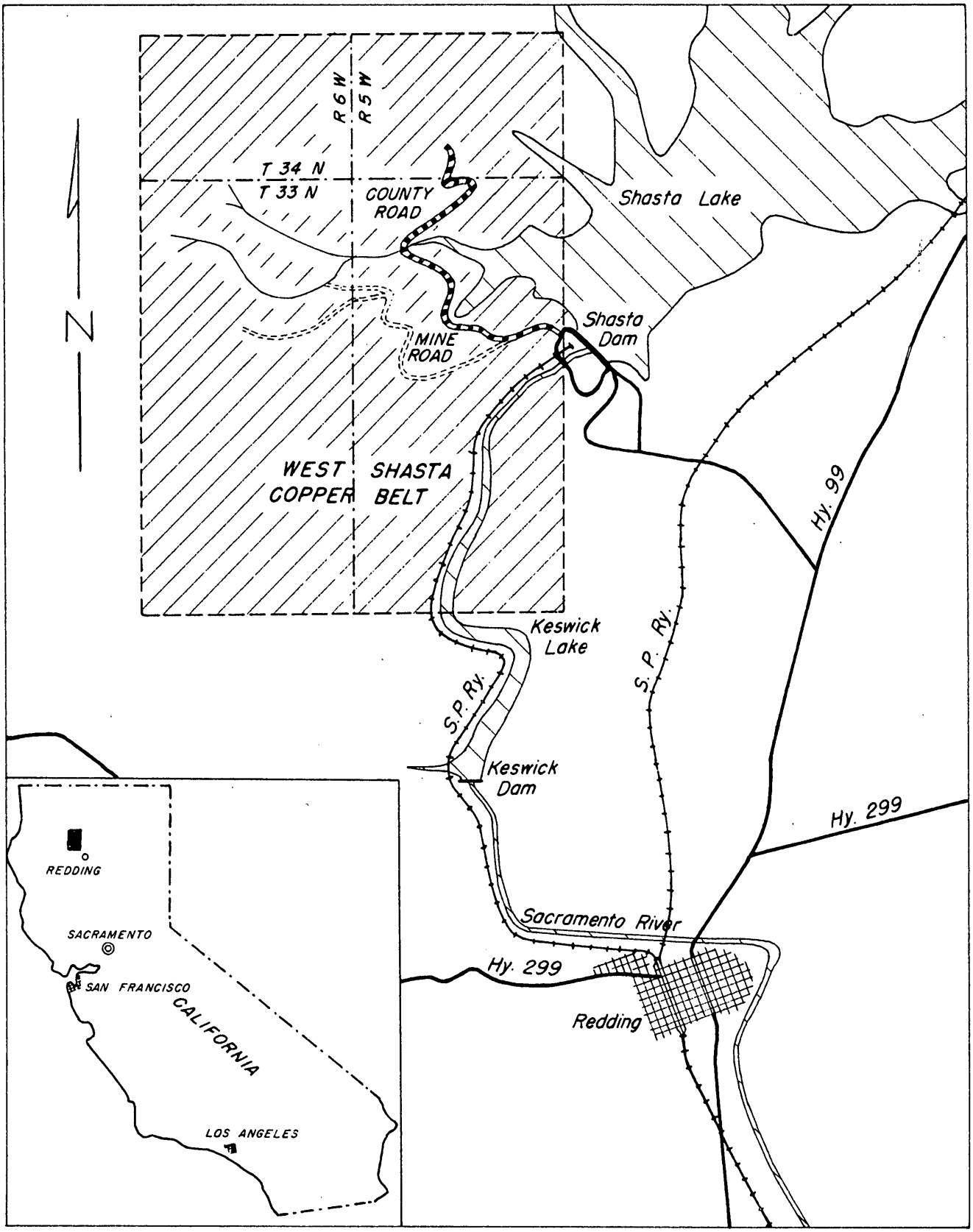

EXHIBIT "A."

Index map showing relationship of West Shasta Copper Belt to existing power service, railroad, highways, and supply centers.

0 1 2 3

SCALE - MILES

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D M E A
RECEIVED JUL 15 1957

DATE	INITIALS	CODE

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
7/8	C	220
7/8	B	215
		225

500

July 8, 1958

Memorandum

To: Director, Division of Operation Control and Statistics

From: Director, Division of Base Metals

Subject: Withdrawal of Application, Docket No. DMEA-4786, Shasta-Phelps Dodge Joint Venture, Sugar Loaf Area, Shasta County, California (Copper-Zinc)

Please consider the cited application as having been withdrawn since the Applicant decided not to sign the proposed contract which we had tendered.

W. R. Griswold

W. R. Griswold

WRG/er
Copy to: Docket
Admr R File
Chron.

8623

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
7/7	ASD	200
7/7	COM	100
7/7	C	225
7/7	WRS	500

STANDARD FORM No. 14
APPROVED BY THE PRESIDENT
MARCH 10, 1926

TELEGRAM

OFFICIAL BUSINESS—GOVERNMENT RATES

FROM Alva D. Bond, Director
Production Control & Statistics
Division

BUREAU Department of the Interior
Defense Materials Production
Administration

CHG. APPROPRIATION 14X4401(01) Revolving Fund, Defense Production Act, Interior, (Transfer to Office of Secretary)

U. S. GOVERNMENT PRINTING OFFICE 10—1723

URGENT

July 7, 1950

Mr. Spencer Decker
Executive Officer
DMEA Region II
300 Booth Avenue
Reno, Nevada

PLEASE WIRE COPY WHETHER CONTRACT AND MONTH-PAPERS DOCS WAS EXECUTED BY MIDNIGHT JUNE 30

C. O. Mittendorf, Administrator

Copy to: Mr. Mittendorf
Admin. Reading File
Chron.
Docket File ✓

8623

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
1605 Evans Avenue
Reno, Nevada

OFFICIAL FILE COPY
DMEA
RECEIVED JUN 27 1958

DATE	INITIALS	CODE
6/27	C	220
6/30	[illegible]	500

June 24, 1958

Memorandum

To: Operating Committee, DMEA, Interior Building
Washington 25, D. C.

From: Executive Officer, DMEA Field Team, Region II

Subject: Docket No. DMEA-4786 (Copper-Zinc)
Shasta-Phelps Dodge Joint Venture
Sugar Loaf Area
Shasta County, California

Enclosed are two copies of a telegram received in this office June 19, 1958 from the Phelps-Dodge Corporation regarding subject docket.

My letter to the Shasta Minerals & Chemical Company dated June 19, 1958 served notice that all copies of the proposed contract should be returned to us if it was not executed by midnight June 30, 1958.

S. Ricker

S. Ricker

Attachments

Telefax WESTERN UNION Telefax

[redacted] RENO NEV 7 [redacted]

1958 JUL 7 PM 12 10

[redacted]

ADMINISTRATOR DEFENSE MINERALS EXPLORATION ADMN

INTERIOR BLDG WASHDC

REURTEL JULY 7 CONTRACT IDP-E 1189 SHASTA-PHELPS DODGE

ARE NOT EXECUTED BY MIDN[redacted] FILE COPY

[redacted] RICKER

DMEA

RECEIVED JUL 7 1958

1958 JUL 7 PM 12 20

DATE	INITIALS	CODE
7/7	C	220
		211
7/8	WPB	[illegible]

1270 (1-51)

WESTERN UNION
TELEGRAM

W. P. MARSHALL, PRESIDENT

Class of Service
This is a fast message unless its deferred character is indicated by the proper symbol.

SYMBOLS
DL = Day Letter
NL = Night Letter
LT = International Letter Telegram

The filing time shown in the date line on domestic telegrams is STANDARD TIME at point of origin. Time of receipt is STANDARD TIME at point of destination

..OA472 LA632

L DOA021 PD=WUX DOUGLAS ARIZ 19 317PMM

=SPANGLER RICKER, EXEC OFFICER=

DMEA FIELD TEAM REGION 2 1605 EVANS AVE RENO NEV=

WE ARE PROCEEDING WITH SUGAR LOAF DIAMOND DRILLING

ON OUR OWN ACCOUNT. BEST REGARDS

= E E MAILLOT PHELPS DODGE CORP=

CODE	INITIALS	DATE

RECEIVED JUN 27 1958

OFFICIAL FILE COPY

6/27/58

ANSWERED

DMEA

SHASTA Minerals & Chemical COMPANY

June [illegible] 1958

R 7/1/58

DMEA
RECEIVED JUL 10
DATE | INITIALS

Mr. Spangler Ricker
Executive Officer
DMEA Field Team, Region II
Reno, Nevada

Dear Mr. Ricker:

Your letter of June 19, 1958 has been received. You are undoubtedly aware by now that Phelps Dodge has refused to sign contract No. DMEA-4750. According to the information I have, they are starting to drill the Sugar Loaf area on their venture funds. I am sorry that this matter has turned out the way it has.

In my letter to you of May 20, 1958, the question was brought up in regards to the extension of the Balaklala loan contract No. 4092. The present termination date is October 1, 1958. In case Phelps Dodge withdraws after drilling two holes in the Sugar Loaf area it would not leave our company sufficient time to complete this contract at the present termination date. Under the Joint Venture Agreement Phelps Dodge does not have to notify Shasta until December 1, 1958 whether or not they plan to withdraw or go ahead during 1959. If we do not encounter any important discoveries in either of the two holes being drilled in the Sugar Loaf area, Phelps Dodge will undoubtedly withdraw. It may be that they will notify us before the December 1 deadline in order that we might at least complete Phase I of the Balaklala loan contract prior to its termination date of October 1.

In case Phelps Dodge does withdraw, it will have no bearing whatsoever on our proposed program of further drilling and exploration in the district. I am in hopes that nothing will happen which will make it impossible for us to secure further DMEA help in our program. You and your department have certainly been most cooperative and helpful in the past.

Sincerely yours,

K. L. Stoker
President

KLStoch

cc: W.Walker

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
1605 Evans Avenue
Reno, Nevada

OFFICIAL FILE COPY
DMEA
RECEIVED JUN 23 1958

DATE	INITIALS	CODE
6/23	Cor	220
6/24	[illegible]	500

June 19, 1958

Shasta Minerals & Chemical Company
612 Dooly Building
Salt Lake City 1, Utah

Re: Docket No. DMEA-4786 (Copper-Zinc)
Shasta-Phelps Dodge Joint Venture
Sugar Loaf Area
Shasta County, California

Gentlemen:

Letters from Evans, Kitchel & Jenckes, dated May 24, 1958, and K. L. Stoker, dated May 26, 1958, relative to changes in proposed contract on referenced project were forwarded to our Washington office for consideration.

We have been advised that your suggested changes in regard to assignment are completely contrary to the intent of the contract and to our established procedure and cannot be approved by the Government.

We hope that you decide to execute the contract as written; otherwise, all copies should be returned to us unsigned. If executed, they should be in this office by midnight June 30, 1958, as the DMEA program, except for contracts in force, is terminated on that date.

Very truly yours,

S. RICKER

S. Ricker
Executive Officer
DMEA Field Team, Region II

Copy to: Mr. William A. Evans, Phoenix, Ariz.

SRicker:ft
cc: Opr. Com., DMEA, Wash., D.C.
Finance Office, Region II
GeoMavor
RMSmith
File
Chron

DME Form 7
(12-56)

Revised Sol. Office
6/10/58
500

JUN 12 1958

OFFICIAL FILE COPY

Date	Surname	Code
6/4	Griswold	500
	Long	140
	Dunger	140
6/11	Selfridge	130
"	Johnson	110
"	Hallendorf	200
6/12	C	220
		500

r. Spangler Ricker
xecutive Officer
DMEA Field Team, Region II
1305 Evans Avenue
Reno, Nevada

Re: Docket No. DMEA-4786 (Copper-Zinc)
Shasta-Phelps Dodge Joint Venture
Sugar Loaf Area
Shasta County, California

Dear Mr. Ricker:

We have your May 26 letter, with enclosure, relative to the cited proposed contract.

What Phelps-Dodge is asking, in effect, is that they be allowed to start work under the project but at any time thereafter they may take any unilateral action they see fit, and be free of any obligation under the contract. Any such concept is completely contrary to the intent of the contract and to our established procedure.

Unless they desire to go ahead with the project, in full good faith, all contract copies should be returned to us unsigned.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (GCS)

APPROVED:

Frank D. Lamb (GCS)
Member, Bureau of Mines

Thor H. Kiilsgaard (GCS)
Member, Geological Survey

WRGriswold/er 6/4/58
RWLong/hm 6/10/58
cc: Docket
Admr R File
Op Committee
Mr. McMahon, USBM
Mr. Kiilsgaard, USGS
chron.

8623

DMA Form 7
(2-56)

OFFICIAL FILE COPY

Date	Surname	Code
6/4	Arnold	500
		140
		140
		130
		110
		100
		220 HB
		500

500

Mr. Spangler Ricker
Executive Officer
DMA Field Team, Region II
1605 Evans Avenue
Reno, Nevada

Re: Docket No. DMA-4786 (Copper-Zinc)
Shasta-Phelps Dodge Joint Venture
Sugar Loaf Area
Shasta County, California

Dear Mr. Ricker:

We have your May 26 letter, with enclosure, relative to the cited proposed contract.

What Phelps-Dodge is asking, in effect, is that they be allowed to start work under the project but at any time thereafter they may take any unilateral action they see fit, and be free of any obligation under the contract. Any such concept is completely contrary to the ~~terms~~ intent of the contract and to our established procedure.

Unless they desire to go ahead with the project, in full good faith, all contract copies should be returned to us unsigned.

Sincerely yours,

Chairman, Operating Committee
WRGriswold/er 6/4/58
Copy to: Docket
Admr R File
Op. Committee
Mr. McMahon, USBM
Mr. Kiilsgaard, USGS
Chron.

APPROVED:

Member, Bureau of Mines

Member, Geological Survey

8623

DMEA

OFFICIAL FILE COPY
DMEA
RECEIVED MAY 28 1958

DATE	INITIALS	CODE
5/28		220
5/28	MRG	500

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
1605 Evans Avenue
Reno, Nevada

May 26, 1958

Memorandum

To: Operating Committee, DMEA, Interior Building
Washington 25, D. C.

From: Executive Officer, DMEA Field Team, Region II

Subject: Docket No. DMEA-4092 (Copper-Zinc)
Docket No. DMEA-4786 (Copper-Zinc)
Shasta-Phelps Dodge Joint Venture
Balaklala Mine
Sugar Loaf Area
Shasta County, California
Contract Idm-E 1006
Contract Idm-E 1189

On May 23, 1958, Roscoe Smith and I had a conference with officials of the Shasta-Phelps Dodge Joint Venture relative to subject dockets.

The original and one copy of a letter dated May 24, 1958 from the Phelps-Dodge representative are enclosed. The letter explains the Phelps-Dodge position in detail.

It boils down to the fact that unless 2000 feet of drilling in the Sugar Loaf Area, Contract Idm-E 1189, is encouraging to Phelps-Dodge, they wish to withdraw from both Idm-E 1006 and Idm-E 1189. They, however, refuse to execute Contract No. Idm-E 1189 unless they are released from further obligation upon assignment of interest to Shasta Minerals & Chemical Company.

Mr. K. L. Stoker, representing Shasta Minerals & Chemical Company, appeared willing to accept the Phelps-Dodge terms and accept responsibility to the Government for fulfillment of any obligation by Phelps-Dodge upon acceptance of assignment.

He, however, wishes to keep Contract Idm-E 1006 in force and requires extension of completion time for one more year so that he can make the necessary financial arrangements.

Phelps-Dodge have evidently been hoping to establish a large low-grade ore body in the order of 20,000,000 tons of around one percent copper ore, while the Shasta Minerals have been aiming for smaller ore bodies of the same tenor as those mined in the past.

Shasta Minerals prefers the work on the contract Idm-E 1006 but Phelps Dodge has three men on the Board of Directors against two for Shasta Minerals.

Roscoe Smith and I would like to have the contracts operative if it can be done without prejudice to the Government and believe that significant discoveries may be made. We would appreciate your study of the problem and your suggestion. In the meantime, we should have a letter from Mr. Stoker.

S. Ricker

Attachments

BUREAU OF MINES
WASHINGTON, D. C.
MAY 28 9 47 AM '58

Evans, Kitchel & Jenckes

8TH FLOOR TITLE & TRUST BUILDING
PHOENIX, ARIZONA

WILLIAM A. EVANS
DENISON KITCHEL
JOSEPH S. JENCKES, JR.
RALPH J. LESTER
JOHN F. BOLAND, JR.
EARL H. CARROLL
JAMES M. BUSH

VICTOR S. RANDOLPH, JR.
ALFRED B. CARR
MORTON M. SCULT
L. RAY HAIRE
EDWARD C. LEBEAU

JAMES POWERS

OFFICIAL FILE COPY
DMEA
RECEIVED MAY 28 1958

DATE	INITIAL	CODE

REFER TO	NOTED	DATE
Ricker	BR	5/26/58
Vance		
ANSWERED		

May 24, 1958

Mr. Spangler Ricker
Executive Officer
DMEA Field Team, Region II
1605 Evans Avenue
Reno, Nevada

Re: Shasta - Phelps Dodge Joint Venture
DMEA-4092 (IDM-E1006) and DMEA-4786

Dear Mr. Ricker:

Yesterday a conference was held with you and Mr. Smith at your office in Reno, Nevada, regarding matters affecting the existing and proposed DMEA exploration project contracts with the Shasta - Phelps Dodge Joint Venture. In addition to you and Mr. Smith, there were present Mr. K. L. Stoker representing Shasta Minerals & Chemical Company (formerly Shasta Copper and Uranium Company, Inc.), herein referred to as "Shasta"; Mr. E. E. Maillot of the Geophysical Research and Exploration Department of Phelps Dodge Corporation and the writer representing Phelps Dodge Corporation, herein referred to as "Phelps Dodge"; and Mr. W. J. Walker representing Walker Engineering Corporation, the owner of the properties, herein referred to as "Walker".

As a result of the conference, you suggested that the matters discussed be presented in the form of a letter on behalf of Phelps Dodge which you could refer to your Washington office in order to obtain prompt clarification of the questions presented, and you also suggested that Mr. Stoker, on behalf of Shasta, write a letter along confirmatory lines.

As you know, the Shasta - Phelps Dodge Joint Venture was created by Agreement dated July 1, 1956, copies of which Agreement were furnished in connection with DMEA-4092, Contract No. IDM-E1006. The purpose of the Agreement was the exploration by the Joint Venture of the Walker properties with

DEPARTMENT OF INTERIOR
BUREAU OF MINES
REGION II
RECEIVED

1956 MAY 25 AM 9:52

RENO, NEVADA

funds to be contributed by the parties, as well as through any exploration project contracts which might be approved by the Joint Venture and entered into with DMEA. Under the terms of the Joint Venture Agreement, and particularly Clause 9, Phelps Dodge may elect to terminate the Joint Venture as of the close of the calendar year in which it notifies Shasta prior to December 1st of such election, and thereupon assign to Shasta all of its interest in the Joint Venture's assets and properties.

Contract No. IDM-E1006, dated August 31, 1956, and involving work on the Shasta King, Early Bird and Angle Station areas of the Walker properties, was entered into by the Joint Venture with DMEA. Amendment No. 1 to this contract extended the time for the completion of work thereunder to October 1, 1958. This contract provided for work in two stages, the estimated cost of Stage I being $64,530 and the estimated cost of Stage II being $45,290, and for DMEA participation in the cost of this work at 50%. The Stage I work involved drilling an estimated 6,360 feet of which 5,429 feet has been drilled. The unexpended amount of the total estimated cost of the Stage I work is $11,830.88, of which amount $7,083.20 is for drilling and the balance is for other items.

The operating program adopted by the Joint Board for the year 1958 provides for the drilling of approximately 2,000 feet on the area of the Walker properties commonly referred to as the "Sugar Loaf" area. This program, and the contribution to the Joint Venture for the year 1958, will permit the drilling of two holes of desired depth. No provision has been made in the 1958 program for further drilling under either Stage I or Stage II of IDM-E1006 on the area of the Walker properties covered thereby, and the funds contributed to the Joint Venture for 1958 have been allocated exclusively to the drilling in the Sugar Loaf area.

In order to provide for further exploration work in the Sugar Loaf area, application has been made under Docket No. DMEA-4786 for drilling four holes under Stage I at a total estimated cost of $47,417.75, and additional drilling under Stage II at a total estimated cost of $132,752.25. It is our understanding that this application has been approved and that DMEA is prepared to enter into an exploration project contract for this work if the Joint Venture desires.

It is quite probable that unless the two holes in the Sugar Loaf area which are provided for in the 1958 program adopted by the Joint Board indicate an ore deposit of very large tonnage, Phelps Dodge will elect to withdraw from the Joint Venture during the year 1958 and to assign its interest to Shasta. It will require approximately two months time to complete these two holes after the work is commenced, following which it will be necessary for Phelps Dodge to evaluate the results and to reach an ultimate decision as to whether to terminate the Joint Venture. In case Phelps Dodge should elect to terminate the Joint Venture, Shasta advises that it will take over the properties and will assume the performance of further work under the DMEA exploration project contracts and will continue exploration and development activities on the properties.

It is the desire of Phelps Dodge, in the event of termination of the Joint Venture, that there be preserved to Shasta all loan benefits under Contract IDM-E1006 and any contract which may be entered into under Docket No. DMEA-4786, if this result can be accomplished in such manner that Phelps Dodge will not be responsible to DMEA for the performance of any work after it withdraws from the Joint Venture, or as surety for repayment to DMEA of loan funds advanced to Shasta after Phelps Dodge terminates the Joint Venture. In other words, it is the view of Phelps Dodge that if it terminates the Joint Venture and assigns its interest to Shasta, Phelps Dodge should not be under any obligation to DMEA with respect to performance of work subsequent to such termination or the repayment of loans for this work.

In the course of our discussion, you showed us form of assignment of contract which had been used and approved in connection with DMEA exploration project contracts entered into with others. The form carries the Government's consent in words as follows: "The Government, this _____ day of _____, 19__, without releasing the Assignor from any of the terms, provisions, and conditions of the contract assigned, hereby consents to the foregoing assignment." We pointed out that it would be desired to change the form of consent to eliminate the phrase "without releasing the Assignor from any of the terms, provisions, and conditions of the contract assigned" and to insert at the end of the consent form the words "and hereby releases the Assignor from any obligation for the performance of further work under this contract or for the repayment of loans made to the Assignee

for such further work", or other language similar in substance.

It was pointed out that commencement of drilling of the two holes in the Sugar Loaf area was being deferred until it could be determined whether, if Phelps Dodge terminates the Joint Venture after these holes are completed, DMEA would consent to (i) assignment to and assumption by Shasta of the exploration project contracts, and (ii) release of Phelps Dodge from obligation for performance of further work and as surety for repayment of loans for this further work. It was also pointed out that the Joint Board would not be willing to authorize the Joint Venture to enter into an exploration project contract under Docket No. DMEA-4786 unless DMEA first assured Phelps Dodge that DMEA would consent to the above.

As discussed with you, in case Phelps Dodge terminates the Joint Venture, it will then be possible for Shasta to proceed with work under Contract No. IDM-E1006, but in order to make new arrangements for the resumption of the Stage I work and also the Stage II work under this contract, some additional time will be required after Phelps Dodge assigns the contract to Shasta. Under the circumstances, it does not appear likely that this work will be completed by October 1, 1958, and consequently it appears that an extension of this contract for an adequate period of time will be necessary.

It will be appreciated if these matters can be given prompt consideration by the Defense Minerals Exploration Administration, and we hope that you will be in position to advise regarding the same at an early date.

Yours very truly,

William A. Evans

William A. Evans

cc: Mr. Walter C. Lawson
Mr. K. L. Stoker
Mr. W. J. Walker
Mr. E. E. Maillot

WAE/hp

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
1605 Evans Avenue
Reno, Nevada

ORIGINAL
DMEA
RECEIVED MAY 19 1958
DMEA
5-19 C 220
5-20 ~~wpb~~ 500

May 15, 1958

Mr. W. J. Walker
Shasta-Phelps Dodge Joint Venture
P. O. Box 857
Redding, California

Re: Docket No. DMEA-4786 (Copper-Zinc)
Shasta-Phelps Dodge Joint Venture
Sugar Loaf Area
Shasta County, California

Dear Mr. Walker:

We are enclosing the original and four copies of a proposed long-form contract for the above-referenced project, signed by the Administrator for the Government. Attached to the contract are Annex I (two pages), Exhibit "A" (six pages), and two maps.

If the contract meets with your approval, all five copies should be signed by your firm. The copy marked "Operator's copy" should be retained by you and the original and other three copies should be returned to this office.

If any part of the contract does not meet with your approval, the original and all copies should be returned to this office with your suggested changes.

Very truly yours,

S. Ricker
Executive Officer
DMEA Field Team, Region II

Attachments
SRicker:ft
cc: Opr. Com., DMEA, Wash., D.C. (2)
RMSmith
File
Chron

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
5/14	Griswold	500
5/14	GCS	130
5/14	[illegible]	110
"	[illegible]	100
5/15	C	220
		500

MAY 15 1958

WRGriswold/er Rm 4442, Ext. 3669

DMEA - Division of Base Metals

14X4401(01) Revolving Fund,
Defense Production Act, Interior,
(Transfer to Office of Secy.)

TELEGRAM

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

To: Mr. Spangler Ricker
Executive Officer
DMEA Field Team, Region II
1605 Evans Avenue
Reno, Nevada

Reurmemo May 12, Docket DMEA-4786, Shasta-Phelps Dodge Joint Venture, Contract Idm-E1189. Contract may now be presented for signature.

George C. Selfridge

Chairman, Operating Committee (JHB)

WRGriswold/er 5/14/58
Copy to: Admr R File
Docket
Op. Committee
Mr. Bishop, USBM
Mr. Kiilsgaard, USGS
Chron.
Confirmation Copy

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code

May 14, 1958

Memorandum for the Docket

From: Director, Division of Base Metals

Subject: Docket No. DMEA-4786, Shasta-Phelps Dodge Joint Venture, Sugar Loaf Area, Shasta County, California Copper-Zinc.

Re contents of the telegram to Ricker of this date, the matter was cleared with Mr. Long of the Legal Division.

W. R. Griswold

W. R. Griswold

8623

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
1605 Evans Avenue
Reno, Nevada

May 12, 1958

OFFICIAL FILE COPY
DMEA
RECEIVED MAY 14 1958

DATE	INITIALS	CODE
5/14	C	220
5/14	corps.	500

Memorandum

To: Operating Committee, DMEA, Interior Building
Washington 25, D. C.

From: Executive Officer, DMEA Field Team, Region II

Subject: Docket No. DMEA-4786 (Copper-Zinc)
Shasta-Phelps Dodge Joint Venture
Sugar Loaf Area
Shasta County, California

Enclosed are the following documents relative to postscript on your letter of May 2, 1958, with which you enclosed proposed contract on subject docket:

(1) Declaration of Trust
(2) Agreement of Merger
(3) Lease and Option
(4) Joint Venture Agreement
(5) Your two copies of Consent to Lien and Subordination Agreement

I believe these documents are in order. Please confirm by telegram so that the contract can be presented to the operator for execution.

S. Ricker

Attachments

BUREAU OF MINES
WASHINGTON, D. C.

MAY 14 9 39 AM '58

OFFICIAL FILE COPY
DMEA
RECEIVED MAY 12 1958

DATE		CODE
5/12	C	220
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1605 Evans Avenue
Reno, Nevada

May 6, 1958

Mr. W. J. Walker
Shasta-Phelps Dodge Joint Venture
P. O. Box 857
Redding, California

Re: Docket No. DMEA-4786 (Copper-Zinc)
Shasta-Phelps Dodge Joint Venture
Sugar Loaf Area
Shasta County, California

Dear Mr. Walker:

We have received contract today, signed by the Administrator, but must hold it here until you sign the enclosed six copies of the Consent to Lien and Subordination Agreement forms, MF-205. The previous Consents to Lien were executed on the obsolete forms.

The Operator's and Extra copies are for your files. The remaining four should be returned to this office promptly.

In addition, the Lease and Option, dated July 1, 1956, covering the lands under the project, is between Walker Engineering Corporation and Shasta Copper & Uranium Company, Inc. We, therefore, require an adequate document showing that such land is now in possession of the present joint venture.

We shall be pleased to send the contract, dated May 2, 1958, for your execution as soon as we receive the above-cited documents.

Enclosed is an extra copy of Annex I for your study.

Ypu will note that a certain portion of the holes are angle holes. Please return this copy upon receipt of contract, to which Annex I will be attached.

Very truly yours,

S. RICKER

S. Ricker
Executive Officer
DMEA Field Team, Region II

Attachments
SRicker:ft
cc: Opr. Com., DMEA, Wash., D.C.
RMSmith
File
Chron

Probably more mapping should have been done, but it seems too late to go into ~~this~~ this now. Although First Stage is prospecting, I do not have any definite objections.

FEJohnson

DMEA-4786

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
4/29	Griswold	500
	Chambers	800
5/2	GCS	130
"	Jones	110
"	Gatewood	100
5/5		220
		500

500

MAY 2 1958

Mr. Spangler Ricker
Executive Officer
DMEA Field Team, Region II
1605 Evans Avenue
Reno, Nevada

Re: Docket No. DMEA-4786 (Copper-Zinc)
Shasta-Phelps Dodge Joint Venture
Sugar Loaf Area
Shasta County, California

Dear Mr. Ricker:

With reference to your March 21 memorandum, we are enclosing the original and four copies of a proposed long-form contract for the cited project, which have been signed by the Administrator for the Government. The contract consists of the form, Annex I (two pages), Owner's Consent to Lien (two pages), Exhibit "A" (six pages) and two maps. We are also enclosing two extra copies of the contract, minus the form, for the use of the Field Team.

We have departed to some extent from the Field Team's recommendations in that the contract specifies that at least half of the holes must be angled; Mr. A. R. Kinkel, Jr., feels strongly that angle drilling is the more likely to show results. Also, in Stage II, we have reduced the geologist allowance to one fourth time, Mr. Kinkel states that the geologist should fully cover the ground in the Stage I time interval, and that there would be little to do thereafter.

If the contract meets with your approval, kindly present it to the Applicant for approval and signature and, when completed, distribute the copies in the usual manner. Otherwise, and if any proposed change should lie beyond your delegated authority, return all copies to us with your recommendations.

We are also returning the Mayo report, as you requested.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (GHB)

WRGriswold/er 4/29/58

Copy to: Docket
Admr R File
Op. Committee
Mr. Bishop, USBM
Mr. McMahon, USBM
Mr. Kiilsgaard, USGS
Chron.

Enclosures
APPROVED:

Frank D. Lamb (GHB)
Member, Bureau of Mines

Thor H. Kiilsgaard (GHB)
Member, Geological Survey

P. S. Please note that the Lease and Option, dated July 1, 1956, covering the lands under the project, is between Walker Engineering Corporation and Shasta Copper & Uranium Company, Inc. Therefore, you should not present the contract for signature until you receive an adequate document showing that such land is now in the possession of the cited present joint venture.

P.S. The Consents to Lien were executed on an obsolete form. We are enclosing copies of the new forms ready for signature. Kindly present them for execution by the owners before presenting the contract for signature.

8623

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
4/29	[illegible]	500
"	Chambers	800
5/2	[illegible]	130
4/30	Lamb	130
4/30	Kilsgaard	130
"	Johnson	110
"	Christensen	100
5/2	[illegible]	220
		500

MAY 2 1958

WRGriswold/er Rm 4442, Ext. 3669

DMEA-Division of Base Metals

14X4401(01) Revolving Fund,
Defense Production Act, Interior,
(Transfer to Office of Secy.)

TELEGRAM

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

Date:

To: Mr. S. Ricker
Executive Officer
DMEA Field Team, Region II
1605 Evans Avenue
Reno, Nevada

CONTRACT FOR DMEA-4786, SHASTA-PHELPS DODGE JOINT VENTURE,

BEING MAILED TO YOU TODAY.

George C. Selfridge

CHAIRMAN, OPERATING COMMITTEE (GCS)

WRGriswold/er 4/29/58
Copy to: Docket
Adrm R File
Op. Committee
Mr. Bishop, USBM
Mr. Kiilsgaard, USGS
Confirmation Copy
Chron.

8623

CLASS OF SERVICE

This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION

TELEGRAM

W. P. MARSHALL, PRESIDENT

1201

SYMBOLS

DL = Day Letter

NL = Night Letter

LT = International Letter Telegram

The filing time shown in the date line on domestic telegrams is STANDARD TIME at point of origin. Time of receipt is STANDARD TIME at point of destination

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1958 APR 30 PM 4 11

OPERATING COMMITTEE DEFENSE MINERALS EXPLORATION ADMIN=

INTERIOR BLDG WASHDC=

Dept Interior

RE TELEPHONE CONVERSATION WITH WILLIS GRISWOLD APRIL 30 DOCKET 4786 SHASTA-PHELPS DODGE JOINT VENTURE, MAY BE OF HELP TO REFER TO SECOND INTERIM AUDIT REPORT DATED MARCH 10 1958 DOCKET 4092 UNDER INTRODUCTION SECOND PARAGRAPH RELATIVE TO CHANGE OF NAME SHASTA COPPER AND URANIUM CO TO SHASTA MINERALS AND CHEMICAL CO=

S RICKER EXECUTIVE OFFICER REGION 2=

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

GENERAL MAIL UNIT
DMEA
RECEIVED MAY 1 1958

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1958 APR 30 PM 4 37
HHR

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
1605 Evans Avenue
Reno, Nevada

OFFICIAL FILE COPY
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RECEIVED MAY 2 1958

DATE	INITIALS	CODE
5/2	C	220
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April 30, 1958

Memorandum

To: Operating Committee, DMEA, Interior Building
Washington 25, D. C.

From: Executive Officer, DMEA Field Team, Region II

Subject: Docket No. DMEA-4786 (Copper-Zinc)
Shasta-Phelps Dodge Joint Venture
Sugar Loaf Area
Shasta County, California

Enclosed are two copies of a letter from K. L. Stoker dated December 13, 1956 regarding the change of name of Shasta Copper and Uranium Company to Shasta Minerals and Chemical Company. This may help Mr. Griswold regarding the problem brought up in telephone conversation April 30, 1958.

S. Ricker

Attachments

BUREAU OF MINES
WASHINGTON, D. C.
MAY 2 9 22 AM '58

SHASTA Minerals & Chemical COMPANY

[illegible] BUILDING
SALT LAKE CITY 1, UTAH

December 15, 1956

OFFICIAL FILE COPY
DMEA
RECEIVED 2 1958
CODE

Mr. Spangler Ricker
Executive Officer
DMEA Field Team
Region II
Reno, Nevada

Dear Mr. Ricker:

You will note by the enclosed signatures that our company has changed its name from Shasta Copper and Uranium Company, Inc. to Shasta Minerals and Chemical Company. Changing the name was necessary in order to franchise our company to do business in the state of California. This action was taken subject to unanimous approval of our stockholders at a Special General Stockholders' Meeting held in Salt Lake City on September 15, 1956.

Very truly yours,

K. L. Stoker
President

KLS:nch

OFFICIAL FILE COPY
DMEA
RECEIVED MAY 2 1958
DATE | INITIAL | CODE

CONFIRMATION

TELEGRAM

APRIL 30, 1958

OPERATING COMMITTEE
DEFENSE MINERALS EXPLORATION ADMINISTRATION
INTERIOR BUILDING
WASHINGTON 25, D. C.

RE TELEPHONE CONVERSATION WITH WILLIS GRISWOLD APRIL 30

DOCKET 4786, SHASTA-PHELPS DODGE JOINT VENTURE, MAY BE OF HELP TO REFER TO SECOND INTERIM AUDIT REPORT DATED MARCH 10, 1958, DOCKET 4092 UNDER INTRODUCTION SECOND PARAGRAPH RELATIVE TO CHANGE OF NAME SHASTA COPPER AND URANIUM COMPANY TO SHASTA MINERALS AND CHEMICAL COMPANY.

S. RICKER
EXECUTIVE OFFICER, REGION II

OFFICIAL FILE COPY

Date	Surname	Code

April 22, 1958

Memorandum

To: Associate Solicitor, Division of Minerals Resources

From: Director, Division of Base Metals

Subject: Preparation of Contract for Docket No. DMEA-4786, Shasta-Phelps Dodge Joint Venture, Surgar Loaf Area, Shasta County, California, Copper-Zinc.

Will you kindly prepare a long-form contract along the lines of the attached draft.

W. R. Griswold

8623

IN REPLY REFER TO:

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

April 18, 1958

Memorandum

To: W. T. Griswold, DMEA

From: A. R. Kinkel, Jr., USGS A R Kinkel Jr

Subject: Proposed drilling on Sugar Loaf Mountain, Shasta County, California -- DMEA Docket No. 4786.

There appears to be a lack of clarity in the various reports that have been turned in to justify drilling in this area. I feel that this is an area that is worthy of exploration because of its proximity to the Iron Mountain mine and because of the indications of mineralization on the surface. Justification for drilling can be briefly outlined as follows:

1. The Iron Mountain mine consists of a series of ore bodies with a northeast trend that extend over a length of about 7,000 feet. Along a good part of this trend the ore bodies seem to be localized along a strong fault zone that I have called the Sugar Loaf Fault. This fault and associated faults appear to have been the principal feeder channels for the ore solutions.

2. This fault extends beyond the Iron Mountain mine, crosses the ridge of Sugar Loaf Mountain, and extends an unknown distance to the northeast. Mineralization occurs all along this fault at the surface, and patches of fairly solid gossan crop out at the fault zone on and northeast of the ridge of Sugar Loaf Mountain. Northeast of the ridge of Sugar Loaf Mountain, the fault grades into a strongly sheared zone that is heavily mineralized, and ore solutions came in along the fault and the shear zone, and were controlled by this strong structure. This mineralization fault and shear zone is a definite target for drilling, but whereas the fault is more or less of a line fault on the Iron Mountain property, it grades into a wider shear zone as it extends northeast. Within this feeder shear zone there are zones of more and less intense mineralization and rock alteration, so that in the areas east of Sugar Loaf peak there are a number of fairly well defined zones of strong mineralization interlayered with less altered bands.

3. The Hornet ore body, the most northeasterly of the Iron Mountain ore bodies, pinches to a very narrow band of ore at Boulder Creek, but northwest of Boulder Creek along the line of strike, the ore lens widens out. The area northeast of Boulder Creek contains the Busy Bee workings which are also on the Sugar Loaf Fault. An adit was driven on the Busy Bee workings for several hundred feet in massive sulfide ore by the Mountain Copper Company, but as the adit approached their property line they put in a cross cut to determine the width of the massive sulfide lens. This massive sulfide lens proved to be 50 feet thick at the end of the Busy Bee workings, but no further exploration was done on this lens because of its low copper content, and its proximity to the property line. The lens probably extends northeast onto the ground of the Joint Ventures Company, and was still widening where it was last seen.

4. The rhyolites in this area have a very complex layering, but there appears to be much porphyritic rhyolite present in the section as shown by surface mapping and by the Joint Ventures' drill holes.

5. All of the ore bodies at the northeast end of the Iron Mountain mine are steeply dipping lenses that parallel the Sugar Loaf Fault and the foliation in the rhyolite. Bedding in this location is not known except in a few places. The bedding in the Sugar Loaf area is only marked by the contact between the Copley greenstone and the rhyolite. This is a steep contact that is almost a straight line across differences of elevation of more than 1,500 feet, and I feel quite certain that the folds in this area will be deep. Foliation is erratic but generally dips about 50 degrees to the north. Thus, regardless of whether the ore deposits are controlled by bedding, by the steep faults, or by the foliation, they will probably consist of steeply-dipping lenses of ore. They would be characteristic of the Hornet ore body at Iron Mountain rather than of the flat-dipping ore lenses in other parts of the district. This is my principal reason for objecting to vertical holes, as I think that holes angling to the southeast would have a better chance of cutting ore.

I agree with McKinstry's report and with Mayo's report that the area should be explored, and that there are definite targets for drilling along this heavily mineralized shear and fault zone. I also agree with these reports in that I think more detailed mapping of the northeastern part of the shear zone would give a better idea of the location of the heavily mineralized zones within the shear zone. It is not difficult in

the field to justify several drill locations that would crosscut heavily mineralized parts of the shear zone in advance of detailed mapping, as bands of strong mineralization are obvious at the surface. However, detailed mapping should be carried on concomitant with the first drilling, so that we can be assured that the later holes, particularly those further to the northeast, will be located on the zone of most intense mineralization.

A R Kinkel Jr

A. R. Kinkel, Jr.

OFFICIAL FILE COPY
DMEA
RECEIVED APR 16 1958

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4/16	C	226
4/16	WRG.	566

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

April 15, 1958

Memorandum

To: W. R. Griswold, Defense Minerals Exploration Administration

From: Commodity Specialist, Branch of Base Metals

Subject: Review of supplemental information, Docket No. DMEA 4786 (copper), Shasta-Phelps Dodge Joint Venture, Sugar Loaf Area, Shasta County, California.

Your memorandum of April 8, 1958, transmitting supplemental information submitted by Mr. Ricker for comments, directed attention to the memoranda of December 5 and 6, by N. E. Nelson, and the Chairman's letter of December 16, 1957. The additional information supplied explanations or recommendations respecting the points emphasized in that correspondence.

Referring to Mr. Nelson's memoranda, maps showing the locations of the Company's diamond drill hole and previous underground workings along with a geologic log of the diamond drill hole were furnished. Mr. Smith's memorandum of March 18, 1958 refers to Professional Paper 285, p. 118, which implies that the middle member of the rhyolite in the southern part of the district cannot be differentiated; and W. J. Walker, in his letter of December 26, 1957 to Roscoe Smith, questions the advantages of drilling inclined instead of vertical holes in the Sugar Loaf area.

The Chairman's letter of December 16, 1957 directed the Field Teams attention to excessive costs for supervisory and technical services, for construction of three steel core-storage buildings, and for 20,000 feet of new access roads; it intimated that the unit drilling cost was too high in comparison with two nearby DMEA projects; and, pointed out the lack of delineation of Stage I diamond drill holes..

Mr. Warne's memorandum of March 21, 1958 suggests a reduction in personal services to one supervisor and one geologist, a per-foot drilling estimate of $8.25 instead of $8.75, two instead of three core-storage buildings, and $0.50 instead of $0.80 per foot for construction of access roads.

Mr. Smith's memorandum of March 18 stated that delineation of Stage I holes could not be determined until preceded by detailed geologic field work. Mr. Smith also suggested that the number of holes for Stage I be reduced from five to four for the same total footage to allow for possible deeper drilling to penetrate target formations.

In my memorandum of December 6, 1957, I questioned the necessity of all the supervisory and technical assistance proposed in the application report of November 18, 1957. In retrospect, it is generally agreed that there is a general exploration objective but to develop specific targets for the location of holes requires a certain amount of detailed geologic study and mapping. I, therefore, suggest that an allowance for geologic study and mapping of the general drilling area be provided for in the contract.

I recommend that consideration be given to entering into an exploration contract substantially as proposed and revised by the Field Team.

A. D. McMahon

A. D. McMahon

Copy to: Division of Minerals
Branch of Base Metals (2)
Thor Kiilsgaard, U.S.G.S..
F. D. Lamb
F i l e s

IN REPLY REFER TO:

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

RECEIVED 7

4-7 C 320
4-8 wrb. 5C

April 4, 1958
Re: DMEA 4786
Shasta-Phelps Dodge Joint Venture
Sugar Loaf Area
Shasta County, California
Applicant's Estimate $270,291.58
Recommended Estimate A $209,742.00
Recommended Estimate B $185,430.00
Copper

Memorandum

To: W. R. Griswold, Defense Minerals Exploration Administration

From: N. E. Nelson, U. S. Geological Survey

Subject: Review of supplemental information concerning Sugar Loaf area.

Telling additional information has been submitted by the applicant in support of the request for assistance in prospecting for 'blind' copper-zinc ore bodies.

As stated by Mr. Walker, the geology of Adit E is of particular interest. The dips of foliation and flow structure as shown, though lacking figures, tend to validate the sections A, B, C, and D of the application. No light is shed on the real dip of the rhyolite-greenstone contact which the Kinkel, Hall, and Albers map shows as steep rather than gently dipping as shown on the sections. Unless there are better reasons than are apparent for ascribing an undulating floor to the syncline, Sections B and C do not reflect well the information now available. As a result, the depths of the holes in Section C appear to be from 530 to 650 shorter than would be required to reach the greenstone. The same inference applies to Section B.

In Section A the approximations are less questionable. The 650-foot change in the boundary of the greenstone near Section D, as shown on the applicant's Geological Map, from the position shown on the Kinkel-Hall-Albers map results, presumedly, from different interpretations. If the interpretation reflected in Section D of the application is correct, the depths of the proposed drill holes are as close as can be guessed. If the K-H-A identification is correct, the depths of the holes of Section D may be out as much as 800 feet.

The log of drill hole S-1 shows several bands of 1-3 mm rhyolite were penetrated. One such band, 1328-1670, rests on the greenstone. Non-porphyritic rhyolite constitutes about 62% of the

rhyolite core. Kinkel-Hall-Albers say the middle rhyolite may rest on greenstone, in which case the lower rhyolite is missing, but such is the exception rather than the rule.

At any rate, whether or not the favored middle rhyolite is present, copper minerals appear to be singularly missing in the 5,610 feet of workings and drill hole (3,850 feet of workings as scaled and 1,760 feet of drill hole). The elevations of the 5 adits range from 3,020 feet to 2,440 plus or minus, and the drill hole crosscuts perhaps 1,400 feet of rhyolite, if we accept the dip of the northerly contact shown on Section C.

No copper is noted as having been seen in Adit E, and the authors of the professional paper saw none on the dumps of the adits. The drill log mentions only a speck of cpy (chalcopyrite) at 920 feet and a cpy veinlet at 1,323 feet. Otherwise only pyrite and gossan appear to have been seen in the outcrops, adits, dumps and drill hole. If there is a 1,000,000-ton 4% copper ore body in the immediate area, it and its halo are well concealed.

In his report, dated September 1, 1957, Mr. Evans B. Mayo, consulting geologist to the applicant, says...."The Sugarloaf area, being large, relatively unexplored and adjacent on the mineral belt to the largest known ore cluster in the district, seems to offer the best possibility of important new ore tonnage. While the field work to date has revealed some encouraging features, it has not yet progressed far enough to reveal all the factors considered essential to localization of ore. Until this work has advanced considerably farther the best targets cannot be selected for exploratory drilling in this area.

It is felt that during the remainder of the current field season priority should be given the Sugarloaf exploration.

.....

It is thought that the geological studies will aid greatly in selecting targets for diamond drilling, and it is hoped that these studies will be extended as broadly as possible. In addition to surface geologic mapping there is need for detailed underground studies of all accessible workings. Such studies would greatly help to reveal the ore occurrences in three dimensions." ....

It would appear that at that time Mr. Mayo felt enough work had not been done in the Sugar Loaf area to enable selections to be made of the best targets for exploratory drilling. Perhaps further work was done, that is after September 1, 1957. If so, the additional information has not been supplied, except the unfavorable information in the log of the drill hole and the map of E Adit. The drilling program set up before July 1, 1957, has not been changed and assuming, as seems likely, he knew of the application, Mr. Mayo quite plainly says the best targets could not (as of Sept. 1) have been selected.

That good targets will be selected for the Stage I drill holes which are to be spotted after further work is done this spring is not yet evident. If Mr. Mayo is still available, his opinion could be valuable.

I recommend that no contract be entered into until a less haphazard drilling program is submitted, a program that makes use of the available and to-be-obtained information.

N. E. Nelson

N. E. Nelson

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
1605 Evans Avenue
Reno, Nevada

March 21, 1958

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3/25	[illegible]	500

Memorandum

To: Operating Committee, DMEA, Interior Building
Washington 25, D. C.

From: Executive Officer, DMEA Field Team, Region II

Subject: Docket No. DMEA-4786 (Copper-Zinc)
Shasta-Phelps Dodge Joint Venture
Sugar Loaf Area
Shasta County, California

In response to your letter of December 16, 1957 we are enclosing one copy of letter with attachments, dated December 26, 1957, from W. J. Walker; two copies of letter with attachments, dated March 12, 1957, from W. J. Walker; two copies of a memorandum from J. D. Warne on revision of costs; one copy of a confidential geological report by Evans B. Mayo; and two copies of a memorandum, dated March 18, 1958, from Roscoe M. Smith.

We would appreciate the return of the report by Evan B. Mayo, as it is the only copy available in our files for future use.

S. Ricker

Attachments

1605 Evans Avenue
Reno, Nevada

March 21, 1958

DMEA
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Memorandum

To: S. Ricker, Executive Officer, DMEA Field Team
Region II

From: John D. Warne

Subject: Docket No. DMEA-4786 (Cu-Zn)
Shasta-Phelps Dodge Joint Venture
Sugar Loaf Area
Shasta County, California

In regard to Mr. Selfridge's letter, dated December 16, 1957, regarding the subject docket, the following comments are made:

All project costs were carefully reviewed in conference with Mr. W. J. Walker, project supervisor, on October 9, 1957 and costs aggregating $60,550.00 were reduced from the original application. Some of the costs recommended had already been reduced below minimum actual amounts for similar work previously performed by the Operator. However, certain additional reductions may still be made subject to approval of the contract by the Applicant. Comments regarding reductions which were suggested, are outlined on cost items in the Application Report, as follows:

(1) Independent Contracts

The cost estimated for diamond drilling at $8.75 per foot is below the actual average minimum charge by contractors for any of the work performed to date, regardless of depth. The contractors' charges for cementing, casing, and other items requisite for drilling in this area have resulted in a minimun charge of about $8.75

per foot for drill holes ranging in depths from 500 to 1,000 feet. Although allowable drilling costs for projects DMEA-3590 and DMEA-4092 were $7.00 and $7.60 per foot, respectively, the Operator has borne more than half of the contractual expenses. It was formerly believed that the drillers could attain greater speed and efficiency as the work progressed, resulting in lower drilling costs, but deep overburden and very difficult drilling conditions have kept drilling costs high. Mr. Walker stated in a letter to us on July 11, 1957 that 6,988 feet of diamond drilling in the Shasta King Mine area, by the MacPherson Drilling Company, was invoiced at $63,677.68 or $9.11 per foot.

The most recent drilling costs decreased and no unusual difficulties or extra costs were encountered in the first hole drilled on Company account in the Sugar Loaf area (Hole No. S-1). If the "extras" (reaming, cementing, surveying, etc.) can be kept at a minimum by close supervision of the work, a lower drilling cost in the Sugar Loaf area may be attained. Therefore, an allowable cost of $8.25/ft. of drilling is suggested, as follows:

17,440 feet of diamond drilling at	$8.25/ft	$143,880.00

(2) Personal Services

The Operator has actually retained a larger staff of engineers and geologists than included in the estimate to supervise drilling and to assemble and evaluate geologic data in connection with the two projects previously in progress. However, the following minimum personnel should be included for proper supervision of the project:

1 supervisor - drill foreman at	$600./mo.	
1 geologist	550./mo.	
	$1,150./mo.	
Total (16 mos.)		$18,400.00

(6) New Buildings, Fixtures, and Installations

Reductions suggested under this sub-title are made, as follows:

2 Butler steel buildings, with core racks (size 8'x10') at $1,000./ea.	$2,000.00
20,000 ft. of new access roads including preparation of drill site stations at $0.50/ft.	10,000.00
Total	$12,000.00

Reduced costs as suggested in Mr. Selfridge's letter are summarized, as follows:

1. Independent contracts - 17,440 ft. of diamond drilling at $8.25/ft.	$143,880.00*
2. Personal Services	18,400.00*
3. Operating materials & supplies	5,512.00
4. Operating equipment	1,488.00
6. New Bldgs., fixtures, & installations	12,000.00*
7. Miscellaneous	3,150.00
8. Contingencies	1,000.00
Total estimated cost of project	$185,430.00
Government's share at 50%	92,715.00

* Items reduced in cost as suggested.

John D. Warne,
Mining Engineer

Mineral Deposits Branch

March 18, 1958

Memorandum

To: S. Ricker, Executive Officer, DMEA Field Team, Region II

From: Roscoe M. Smith

Subject: DMEA-4786 (copper-zinc)
Shasta-Phelps Dodge Joint Venture
Sugar Loaf Area
Shasta County, California

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In response to Mr. Selfridge's letter of December 16, 1957 the following additional background data, to support an exploration project in the Sugar Loaf Area, was obtained from Mr. W. J. Walker:

- Log of diamond drill hole S-1.
- Survey of hole S-1.
- Topographic map of Sugar Loaf area, showing location of hole S-1.
- Geologic map of underground workings in the Sugar Loaf area.
- Geologic progress report on West Shasta district by Evans B. Mayo.
- Two letters from Mr. Walker, December 26, 1957 and March 12, 1858, containing comments on the geologic work done by the Shasta-Phelps Dodge Joint Venture in the district and his reaction to suggested changes in the proposed project.

One copy of each of these items should be forwarded to Washington, together with comments and revised cost estimates prepared by Dave Warne.

Mr. Selfridge's letter also noted that no Stage I drill holes were specifically delineated in the application report. This was intentional inasmuch as the exact locations for these holes cannot be determined until after the completion of geologic field work being done by the applicant, sometime later this spring. However, inasmuch as at least tentative locations must be shown in the contract it is suggested that the middle hole in each of the four lines of proposed holes be designated as a Stage I hole. This can be changed later by amendment to the contract when the exact locations are determined. These four holes are one less than the five proposed in Stage I but it is probable that the holes will be from 100 to 300 feet deeper than earlier estimates so that the total footage for Stage I should be about the same. A revision on total footage to be allowed in the contract should not be necessary.

Ned Nelson raised the question of the middle member of the rhyolite being absent in the Sugar Loaf Area. Kinkle (P.P. 285, p. 118) points out that in the northern part of the district the middle member has been differentiated, but in the southern part of the district the middle member cannot be differentiated. Here the middle and lower members are almost identical and both must be considered favorable host rocks. The Sugar Loaf area (and hole S-1, log enclosed) is in the southern part of the district.

Art Kinkle considers our estimate of 1,000,000 tons of 4 percent copper ore to be optimistic, but we are not informed of his reasons. Our estimate is based on the habit pattern of other ore bodies in the district with emphasis on those closest to the area of proposed exploration. Professional Paper 285 (Table 5, p. 78) lists 14 ore bodies mined in the West Shasta district. These average 997,719 tons per ore body. The ore bodies nearest to the area of exploration are the Iron Mountain with three sulfide copper-zinc ore bodies, and the Stowell ore body. The Iron Mountain ore bodies total 2,808,000 tons and average 936,000 tons each and the weighted average grade is 5.6 percent copper, 3.5 percent zinc, and 0.8 ounce of silver per ton. These figures are for 1952 and mining is still in progress. The Stowell ore body yielded 39,538 tons which averaged 3.05 percent copper, 1.09 ounce of silver per ton, and an unknown amount of zinc. The weighted average grade of the Iron Mountain and Stowell ore bodies is 5.5 percent copper.

From these data it appears reasonable to infer that one or more bodies totaling 1,000,000 tons averaging 4 percent copper, 5 percent zinc, and 1 ounce of silver per ton may be found by the proposed work.

SHASTA-PHELPS DODGE JOINT VENTURE

P. O. BOX 857
REDDING, CALIFORNIA

PHELPS DODGE CORPORATION
DOUGLAS, ARIZONA

SHASTA MINERALS & CHEMICAL CO.
612 DOOLY BUILDING
SALT LAKE CITY, UTAH

March 12, 1958

Mr. Roscoe Smith, member
DMEA Field Team, Region II
U S G S
4 Homewood Place
Menlo Park, California

Re: Docket DMEA-4786 (copper-zinc)
Shasta-Phelps Dodge Joint Venture
Sugar Loaf Area
Shasta County, California

Dear Roscoe:

RECEIVED
MAR 1 4 1958
MINERAL DEPOSITS BRANCH
U. S. GEOLOGICAL SURVEY
MENLO PARK, CALIFORNIA

I have your letter of February 18 regarding maps of the underground workings that I promised to send you.

Enclosed are prints of two maps, one 200 scale topographic map of part of the Sugar Loaf area (showing hole S-1) and the other of the underground workings in part of the area. These are the principal workings and the only ones of consequence. I have not shown the proposed drill holes on the map.

Of all the workings, the one marked Adit B, a cross-cut, is most instructive. We re-opened this adit at a cost of several thousand dollars. We had to re-timber five hundred feet of it, much of it had to be spiled. We bought 600 feet of mine rail for this job. I have not tried to indicate the magnitude of the dips of the foliation mapped in this adit on the 200 scale map. In general they average about 35°. The veins dip as shown, the dips varying from vertical to 45° and averaging about 70°. Only two rock types are distinguished, the 1-4 mm rhyolite and the non-porphyritic rhyolite.

Examination of the adit shows that the entire working is in the south limb of the Sugar Loaf syncline. The northeast-southwest drifts near the northwest end of the adit follow an unusually strong structure containing four or five feet of coarse pyrite. The adit is still in the oxide zone to this point, beyond it is in sulphides. No chalcopyrite was observed in the adit.

No structure comparable to the Sugar Loaf fault was mapped in the adit, although it is possible that a large structure may have been encountered in the area of heavy timbering where the nature of the ground prevented observation. A large structure is visible near the portal of Adit D (caved) but lack of other exposures prevent projection.

We considered using adit B as a base for diamond drilling but decided against it for the following reasons:

1. Foliation indicated that the bottom of the syncline would be a substantial distance ahead of the face (later confirmed by surface mapping), consequently, drill holes would be inclined in the same direction as the foliation and would be apt to conform to the foliation with depth.

COPY

2. The intersection of the system of veins with the lower 1-4 mm horizon could not be investigated in a synclinal area from the adit.

3. The cost of buying rail, 1" and 2" pipe, renting a compressor and drill, buying drill steel, etc., plus the cost of labor and materials for preparation of diamond drill stations underground would be comparable to the cost of preparation of surface stations and the additional depth of drilling required from the surface.

4. Experience of the USGS at Iron Mountain indicated that holes started on an incline in this district are apt to wander on strike and dip. We believe that vertical holes are better for exploration purposes in this area.

I believe that these maps will be suitable for your purpose. The geology is sketchy. Economic conditions here have prevented my completing the surface mapping of the area, which I hope to be able to do later this spring. We expect to resume diamond drilling at the Balaklala in April and will start on the Sugar Loaf area as soon as a contract is received.

Very truly yours,

cc E. E. Maillot

W. J. Walker

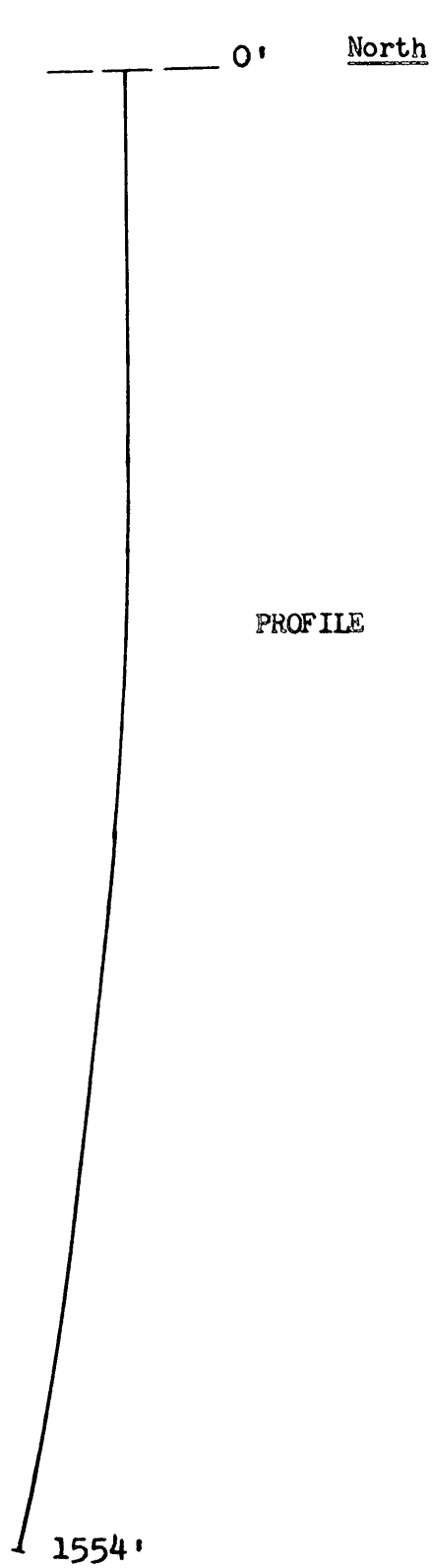
SHASTA-PHELPS DODGE JOINT VENTURE
REDDING, CALIFORNIA

PLAN AND PROFILE OF SUGARLOAF HOLE S-1

Surveyed 10/16/57 by
Sperry-Sun Drill Hole Surveying Company

1" = 200'

PLAN



PROFILE

The hole is collared vertically.
At the bottom the bearing is South 5°W and the inclination is 11°30' from the vertical.

The hole was cased to 1100 feet and the casing prevented determination of course between this point and the collar. Dip angles were irregular above this point.

The deviation on strike and dip were interpolated above 1100 feet.

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DMEA
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DATE		

SHASTA-PHELPS DODGE JOINT VENTURE

P. O. BOX 857
REDDING, CALIFORNIA

PHELPS DODGE CORPORATION
DOUGLAS, ARIZONA

SHASTA MINERALS & CHEMICAL CO.
612 DOOLY BUILDING
SALT LAKE CITY, UTAH

December 26, 1957

RECEIVED 24 1957

Roscoe A. Smith, member
USGS Field Team, Region II
Mineral Deposits Branch
Geological Survey
4 Homewood Place
Menlo Park, California

Re: USGS-4736 (copper-zinc)
Shasta-Phelps Dodge Joint Venture
Sugarloaf Area
Shasta County, California

Dear Roscoe:

Enclosed are three copies of the log of the hole drilled by the Joint Venture in the Sugarloaf area. I have not yet completed detailed mapping of the accessible workings. However, the most important opening is probably the cross-cut adit which we have re-opened and which I have mapped in detail. We will prepare and send three prints of this map separately.

We have had the Sperry-Sun Company survey the Sugarloaf hole and enclosed are three copies of the plan and profile of this hole for your information. It is interesting to note how little deviation occurred in this vertical hole compared to the hole drilled by the USGS at Iron Mountain and illustrated on page 127 of Professional Paper 285. The USGS hole was collared at -70½° and showed a great deal of horizontal and vertical deviation. Target areas would appear to be more difficult to test with holes started at an angle. Whether the holes are started inclined or vertical they should be surveyed.

Whether the ore bodies in the area are steeply dipping or flat lying is a matter of conjecture. The observed dip of foliation cover the range from 11° to 90°, but the general attitude of the south limb of the Sugarloaf "syncline" is about 30° to the northwest. At this time I am uncertain as to the propriety of identifying the Sugarloaf "syncline" as such. The identification of the "syncline" is based largely on the interpretation of the greenstone area in Boulder Creek northwest of the Hornet Mine on Copley, but my detailed mapping, incomplete as it is, raises the question in my mind that this may be an explosion breccia that should properly be assigned to the Balaklala. What small area I have mapped is almost entirely underlain by fragmental rocks, very anguler. It is true that the great bulk of the fragments are greenstone, but most of the matrix appears to be fine rhyolite and fragments of porphyritic rhyolite are by no means uncommon. This would also fit the picture obtained by detailed mapping of the ridge northwest of Sugarloaf peak, which is mapped in the paper as Copley greenstone and diabase and which I map as rhyolitic tuff and diabase. This difference of opinion in no way reflects on the excellence of the mapping done by the Survey in the area but merely

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BUREAU OF MINES
REGION II
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RENO, NEVADA

points up problems of interpretation which are bound to rise as detailed mapping proceeds. We have the vast benefit of good access which can only be experienced to be appreciated. However, even my own interpretations will have to be confirmed by thin sections before I am satisfied with them.

I have gone into some detail in the preceding paragraph because I believe we may find, as detailed mapping progresses, that the ore occurences in this area may be associated with drag folds* whose axis is transverse to the major district axis, and that these minor folds may have small amplitude. The rather well developed northeast-southwest zone of shearing may have been the conduit for the ore solutions.

The Survey geologists have developed the theory that the ore solutions preferentially replace the porphyritic rhyolite. There appears to be several of these horizons in the Sugarloaf area, separated by considerable intervals of nonporphyritic rhyolite. It is obvious that an inclined drill hole could only explore one of the horizons where it is in one of the minor folds.

I believe that vertical holes will be more desirable from both geological and mechanical viewpoints. However, I am sure that the Joint Venture would not object to insertion of a clause to the effect that angles of drilling could be changed by mutual agreement between the operator and the government.

Very truly yours,

W. J. WALKER

WJW/md
cc: R.S.Maillot
W.C.Lawson
E.L.Stoker
Enc.

* Suggested as a possibility this summer by John Albers, USGS

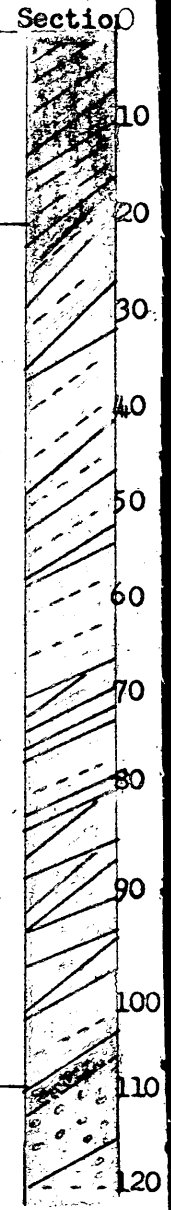
SHASTA-PHELPS DODGE JOINT VENTURE
SHASTA COPPER BELT EXPLORATION

GEOLOGIC LOG

Hole No. S-1 Sheet No. 1
Coordinates. 494861.7 N 1859221.3 E
Type Drill DD Bit Size NX, BX, AX
Date Started 9-5-57

Collar Elevation 3520.6
Total Footage 1760'
Logged By CPM, RBL, WJW
Date Completed 10-22-57

From	To	Core Recovery	Type	Rock Description	Alteration	Metallization	Angle to Core
0	8	57%	NP	Gen. light brown-buff, v.f.gr.rhy. rare qtz.phenos. locally obs. Mod. fracturing	Strong clay (Weathered zone) V. weak silicificat'n	Gen. oxidized and weathered. RB FeOx on fractures and occasional spking— Mod.mineralization	55° 60°
8	20'3"	83%	Frag. (agg?)	Gen. lt.brn.to buff. NP frags. in np. matrix with spotty phenos. in matrix.	"	"	
20'3"	110'6"	89%	1-3mm rhy.	Gen. tan groundmass with abun. qtz. phenos. moderately fractured locally shattered.	"	" Scattered oxidized veinlets. Trace residual sulphide strength of mineralization appears to increase with depth	50° 45° 45° 55° 50° 55° 55° 65° 65° 60° 60° 50° 55°
110'6"	139'	90%	Frag'l	Gen.buff fragmental rock—fairly coarse frags of np. in np. ground-mass.	Strong clay alt. (Weathering)	Gen. oxidized (Weathered zone)	60°



SHASTA-PHELPS DODGE JOINT VENTURE
SHASTA COPPER BELT EXPLORATION

GEOLOGIC LOG

Hole No. S-1 Sheet No. 2
Coordinates. 494861.7 N 1859221.3 E
Type Drill DD Bit Size NX, BX, AX
Date Started 9-5-57

Collar Elevation 3520.6
Total Footage 1760'
Logged By CPM, RBL, WJW
Date Completed 10-22-57

From	To	Core Recovery	Type	Rock Description	Alteration	Metallization	Angle to Core	Section
				Some flow banding Mod. fracturing Local areas of qtz. phenos.	Spotty silicification	RBFeOx on fractures Trs. FeOx spking Trs. residual sul. (pyrite) Zone of str. min. (128-139) Str.	50° 60°	120 130
139'	145'		NP spotty qtz. ph's.	Gen. tan fine grained rhyolite Mod. fracturing	Strong clay alt. (Weathering) Spotty silicification	RBFeOx vlts. & spking trs. resid. (pyrite) Weak RBFeOx mainly on fract. Trs. spking	45° 60°	140
145'	177'	100%	NP	Lt. gray with chl. & some sulphide making core appear splotchy grading into gray more weathered looking (Slightly frag.—more apparent in oxidized brownish segment of core) More frag. app. from 167' Frag. & matrix both nonpor.	Mod. silicif. Some alt. to clay Oxidized zone 160-190'	Trs. residual sulphide Mod. sulphide speck. Def. zones of sul. banding.	50° 40° 50° 35°	150 160 170
177'	195'	100%	NP (frag. agg?)	Very frag.—as above	"	"	35°	180 190
195'	236'	100%	"	Lt. gray splotchy " More abundant phenocrysts 1-mm very frag.	" Oxidized zone	"	40° 50° 50°	200 210 220 230
							40°	240

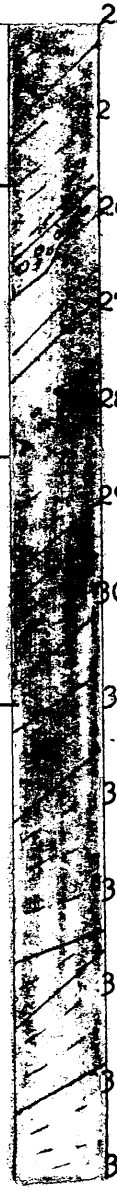
Hole No. S-1 Sheet No. 3
Coordinates. 494861.7 N 1859221.3 E
Type Drill DD Bit Size NX, BX, AX
Date Started 9-5-57

SHASTA-PHELPS DODGE JOINT VENTURE
SHASTA COPPER BELT EXPLORATION

GEOLOGIC LOG

Collar Elevation 3520.6
Total Footage 1760'
Logged By CPM, RBL, WJW
Date Completed 10-22-57

From	To	Core Recovery	Type	Rock Description	Alteration	Metallization	Angle to Core
236'	257'	100%	NP	F.grained np. frag. locally Oxidized zone is also fractured (crackled), with probable secondary quartz developed.	Silicification; slightly chl.	Scattered pyrite Ox. zone 250-257'	45°
257'	285'	100%	NP Frag. (Flow Bx)	Fragments chloritized and banding around fragments. Zone of heavy frags. 265' Lt. green mineral possibly cu? probably chl. at 275'	Slight oxidation in frag. zone Spotty bands of ox. about 40° to core.	" Ox. zone 272-276' Zone of heavy py. 276' - 285'	45° 40°
285'	311'	93%	NP	Below py zone rock is less frag.; It is crackled & splotchy with py & chl. blebs. Green color Fault zone with breccia	Chl.alt. occasional narrow band of ox. Spotty silicification & koalinization	Mineralization mod. py. Less than 276'-285'	
311'	413'	100%	NP	White np. rhy. Crackled (shearing) Locally finely por.(less than 1mm phenos.) Fault zone--breccia with heavy py. Chl. blebs more plentiful below 345' Splotchy appearance	" Chl. along fractures Oxidation along fractures	Mod. py below fault zone. Py follows fractures, & also locally heavy	55° 50° 70° 50° 60°



Hole No. S-1 Sheet No. 4
Coordinates. 494861.7 N 1859221.3 E
Type Drill DD Bit Size NX, BX, AX
Date Started 9-5-57

SHASTA-PHELPS DODGE JOINT VENTURE
SHASTA COPPER BELT EXPLORATION

GEOLOGIC LOG

Collar Elevation 3520.6
Total Footage 1760'
Logged By CPM, RBL, WJW
Date Completed 10-22-57

From	To	Core Recovery	Type	Rock Description	Alteration	Metallization	Angle to Core
				Occasional quartz phenos. zones	In heavy py areas rock is whiter, bleached, possibly due to repl. of chl. blebs & chl. blebs absent. (py replaces the chlorite)	Heavy py. mineralization begins 390' Band of heavy py	50° 45° 50°
413'	461'	100%	1-3mm	Probable 1-3mm rhy with chl blebs, secondary qz. patches; sulphides replacing chl; qz phenos; contact gradational(?) Gray 1-3 with chl. blebs & patchy qtz either resorbed phenocrysts or secondary, probably sec. replacing feldspars Fractured locally	Silicified	V. weak pyrite Minor pyrite Scattered py & py in veins associated with chl. 449-452 zone of more sil. & py; fractured	45° 65°
461'	465'	100%	NP	Gray f. grained, flow banded at contact		Loc. conc. py w/nearly vertical py vlnt.	
465'	473'	100%	1-3mm rhy.	F. grained with blebs of chl. & sec. qz. Frac. at bottom of flow; chl. filling frac.			
473'	487'	100%	NP	F. gr.; chl. blebs & patches parallel to foliation.	Silicified	Scattered pyrite	

Section

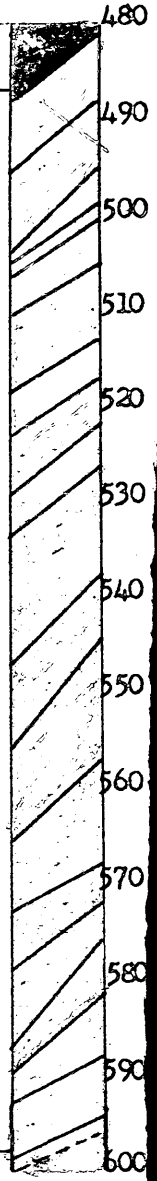
Hole No. S-1 Sheet No. 5
Coordinates. 494861.7 N 1859221.3 E
Type Drill DD Bit Size NX, BX, AX
Date Started 9-5-57

SHASTA-PHELPS DODGE JOINT VENTURE
SHASTA COPPER BELT EXPLORATION

GEOLOGIC LOG

Collar Elevation 3520.6
Total Footage 1760'
Logged By CPM, RBL, WJW
Date Completed 10-22-57

From	To	Core Recovery	Type	Rock Description	Alteration	Metallization	
				Vein of py.; areas associated with chl. & bleached.		Crackled & ext.fract. sil.along contact	
4[illegible]	598'	100%	1-2mm rhy.	Silicified & fractured; grayish-green with chl. blebs, secondary qz. & scattered py chl. blebs abundant	Silicified	Py veinlet perpend. foliation Scattered pyrite Scattered py with occas. qz. rich veinlets Zone of mod. py. Crackled bx zone—probably fault Scattered py. Py veinlet parallel foliation	55° 60° 45° 40° 45° 65° 40° 65°
			1-3mm	Fine grained matrix, with chl. blebs & secondary qz. occasional foreign fragment			



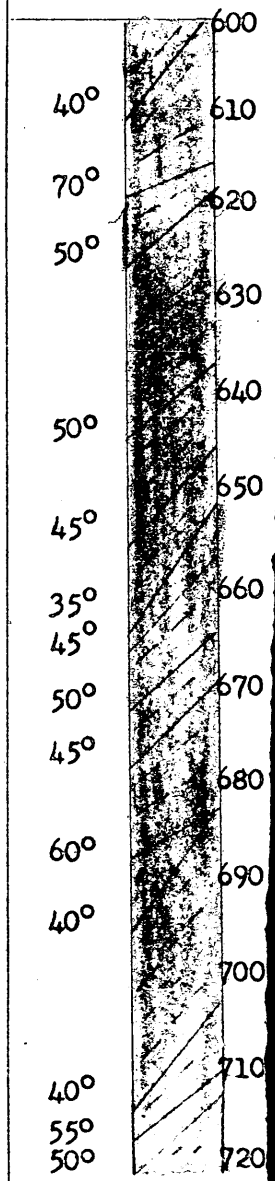
Hole No. S-1 Sheet No. 6
Coordinates. 494861.7 N 1859221.3 E
Type Drill DD Bit Size NX, BX, AX
Date Started 9-5-57

SHASTA-PHELPS DODGE JOINT VENTURE
SHASTA COPPER BELT EXPLORATION

GEOLOGIC LOG

Collar Elevation 3520.6
Total Footage 1760'
Logged By CPM, RBL, WJW
Date Completed 10-22-57

From	To	Core Recovery	Type	Rock Description	Alteration	Metallization
598'			NP	Dense, fine grained, gray, greenish nonporphyritic rhyolite. Chlorite blebs locally— Slightly crackled		Scattered pyrite Mod. pyritization Qz. veinlets
						Zone of py veinlets & mod. pyritization ends about 636'
				Rock has more granular appearance with shadowing chlorite, less fractured		Weak pyritization
				End of granular zone 705 - 716 typical np with uniform py-chl specking		



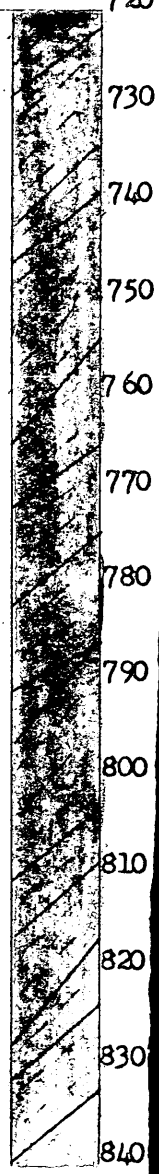
Hole No. S-1 Sheet No. 7
Coordinates. 494861.7 N 1859221.3 E
Type Drill DD Bit Size NX, BX, AX
Date Started 9-5-57

SHASTA-PHELPS DODGE JOINT VENTURE
SHASTA COPPER BELT EXPLORATION

GEOLOGIC LOG

Collar Elevation 3520.6
Total Footage 1760'
Logged By CPM, RBL, WJW
Date Completed 10-22-57

From	To	Core Recovery	Type	Rock Description	Alteration	Metallization	
					Silicification	Band of stronger sulfides 716-722 No cpy.	40° 60°
				Rock more siliceous from 730 to 754 More sulfides & crackling in siliceous layer			
						Qz. veinlet	
						Zone of stronger sulfides No cpy	
						Scattered py	40° 55°
							50°
							60° 40°
				Small crackled zone at 805'			
							50°
							40° 50°



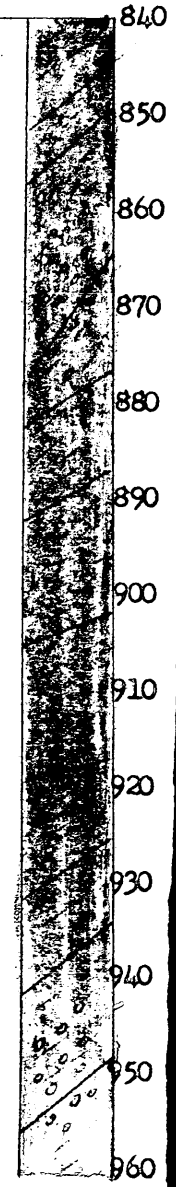
Hole No. S-1 Sheet No. 8
Coordinates. 494861.7 N 1859221.3 E
Type Drill DD Bit Size NX, BX, AX
Date Started 9-5-57

SHASTA-PHELPS DODGE JOINT VENTURE
SHASTA COPPER BELT EXPLORATION

GEOLOGIC LOG

Collar Elevation 3520.6
Total Footage 1760'
Logged By CPM, RBL, WJW
Date Completed 10-22-57

From	To	Core Recovery	Type	Rock Description	Alteration	Metallization	
		100%		More dense and siliceous below 845'		Qz sulfide vonlet	
							50°
						Scattered py	
				End of siliceous rock at 865' 866' Somewhat frag. with basic fragments			
						1 ft. zone of heavier pyrite	
				Chl blebs more plentiful			35°
							60°
				Fragmental zone 887 - 890; fragments of 1-3mm in np matrix; flow banding around fragments. Crackled zone 896-899 with dark chl and py along fractures			60°
							70°
				Fragmental zone 911 - 921			
				Splotchy		Scattered py with one speck of cpy	75°
				Contact between dark green granular rhyolite and silicified rhy 926'	Silicified		
				Qz pheno. locally fragmental zone ends about 930			55°
				Chl specks and blebs			50°
				Fragmental zone 942 - 954		Scattered sulfides narrow band 948'	
						Banding	50°



SHASTA-PHELPS DODGE JOINT VENTURE
SHASTA COPPER BELT EXPLORATION

GEOLOGIC LOG

Hole No. S-1 Sheet No. 9
Coordinates. 494861.7 N 1859221.3 E
Type Drill DD Bit Size NX, BX, AX
Date Started 9-5-57

Collar Elevation 3520.6
Total Footage 1760'
Logged By CPM, RBL, WJW
Date Completed 10-22-57

From	To	Core Recovery	Type	Rock Description	Alteration	Metallization		
								960
				964 - 978 zone of heavy sul. core. No obs. cpy; frags; minor phenos.		Shearing	60°	970
						Approx. contact between gran. & silicified rhy at 970'		980
			NP	Flow banded Fragmental flow banded	High silicification		60°	
						Slightly greater py. in sil. rhy.		990
				Dense silicified rhy., minor chl. specks; locally qz. phenos. Slightly crackled				1000
								1010
						1015-1020 zone of heavy sulf. concen. No obs. cpy		1020
				Crackled at 1027 Broken zone 1030		Py veinlet at 1028	50°	1030
				Crackled zone 1038 Frag. zone underneath crackled zone Thick frag. zone 1040 - 1054. Probably a flow bx. Some frags heavily chloritized. Most frags np Chl. frags, possibly greenstone		Sulfides slightly heavier Sulfides heavier in chl.	45°	1040 1050
1054	1067	100%	Grnstn. or Chl.rhy.	Dark green chl. rock, No phenos. Possibly greenstone, soft		Sul. heavier in chl. areas up to 25% No obs. cpy.	40°	1060
1067	1076	100%	NP frag.	Fragmental rhy similar to above; chl. frag.; flow bx				1070
1076	1080	100%	NP	Dense f.gr.grn.frac.or cr. No phenos.		Sm. sul. sp.-uniform	50°	1080

Hole No. S-1 Sheet No. 10
Coordinates. 494861.7 N 1859221.3 E
Type Drill DD Bit Size NX, BX, AX
Date Started 9-5-57

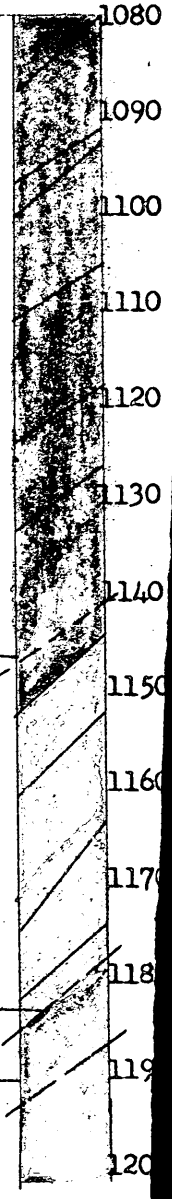
SHASTA-PHELPS DODGE JOINT VENTURE
SHASTA COPPER BELT EXPLORATION

GEOLOGIC LOG

Collar Elevation 3520.6
Total Footage 1760'
Logged By CPM, RBL, WJW
Date Completed 10-22-57

From	To	Core Recovery	Type	Rock Description	Alteration	Metallization	Angle to Core
1080	1147	100%	NP Frag. (Agg.)	~~1080 frag. zone; coarsely frag. w/np. &~~ 1-2 frags, prob. agg.; flow banding Nonpor. rhy. fragments both chl. greenstone & np. rock has mottled green appearance Occasional 1-3mm frag. At 1113 zone of greenstone 6" thick --probably just large frag. Below 1126' chl. greenstone frags. are scarce & frags. mostly np although occasionally 1-3mm frag. Contact about 1147	Silicified	1082 - 1086' Broken-crushed zone sl. heavier sulfide. Scattered sulfides No cpy observed Sul. localized in chloritized frags. 113-5 slightly heavier sulfide Below 1126' sulfide sparse; 1134-5 zone of slightly heavier sulfide.	50° 60° 50° 60° 60° 55°
1147	1184	77%	1-3mm	Gray-green 1-3mm rhyolite-- somewhat fractured Highly silicified; minor chl. frags.	Silicified and secondary quartz veinlets	Sulfides v. sparse-- less than in frags above. Local concen. sulf. 1161'	45° 40° 50°
1184	1191	28%	NP frag.	Frag. and crackled np. chl. alter. probably flow top.	Chl. alt. around frags.		

Section



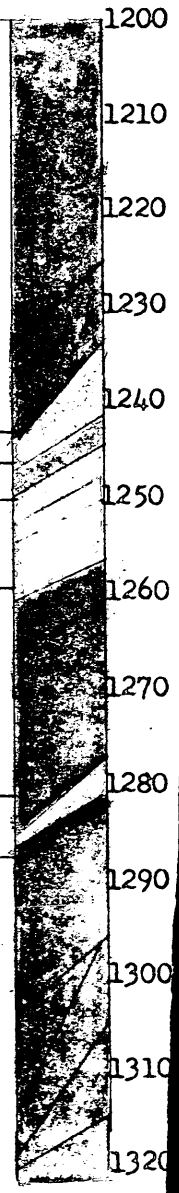
SHASTA-PHELPS DODGE JOINT VENTURE
SHASTA COPPER BELT EXPLORATION

GEOLOGIC LOG

Hole No. S-1 Sheet No. 11
Coordinates. 494861.7 N 1859221.3 E
Type Drill DD Bit Size NX, BX, AX
Date Started 9-5-57

Collar Elevation 3520.6
Total Footage 1760'
Logged By CPM, RBL, WJW
Date Completed 10-22-57

From	To	Core Recovery	Type	Rock Description	Alteration	Metallization	
1191	1243'6"	53%	NP	At contact rock is light gray, dense, highly silicified rhyolite--and then grades downward into greenish gray with chl blebs & stringers; becoming more crackled 1215-1229 rock is mottled fragmental with chl. frags.		Sulfides very sparse Occur as finely disseminated	
	1237	66%		At 1229 rock is non-frag. & intense gray green with chl. blebs. Good flow banding;chl.blebs aligned//to it.		Zone of heavier sul. concen. 1235-1235'6" Very weak sulfides	45° 40°
1243'6"	1246	100%	1-4mm rhy.	Cg.lt.gray; small inclusions	Silicified		
1246	1250	100%	NP	Pos. " 1-4 dike		Attitude of contact	60°
1250	1259	66%	1-4mm	" , but more chloritized 1251-1259 rubble & caved zone ~~crushed core~~			55°
12[illegible]	1281	55%	NP frag.	Frags.angular & chloritized, probably flow bx 1262-9 rubble zone 1273-5 crackled zone,then more gran. 1281 Begin.more dense, silicified rhy.			55°
1281	1287	70%	1-4mm rhy	Chl. frags or clots; crackled zone; aphanitic groundmass		Mod.py at contact between 1-2 & np.	50° 60°
1287	1328	75%	NP	Gray,green np rhy. Finely granular grnmass; intensely silic; locally qz. veinlets Somewhat more granular at 1293 1297 zone of qz.vlnts; highly silif. Crackled zone 1299-1301		Scattered sulfide, no cpy. 1297 mod. sulfide; scattered cpy 1302-4 cluster of sulf.veinlets	50° 30° 35° 55°



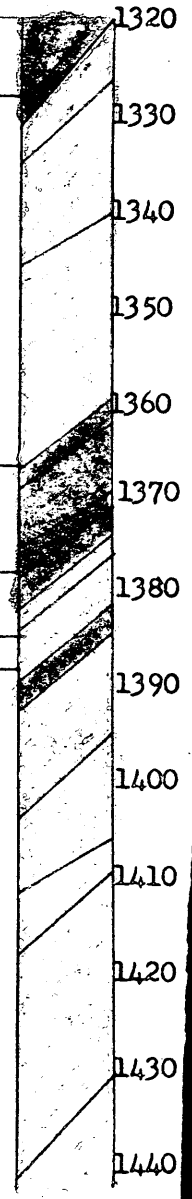
Hole No. S-1 Sheet No. 12
Coordinates. 494861.7 N 1859221.3 E
Type Drill DD Bit Size NX, BX, AX
Date Started 9-5-57

SHASTA-PHELPS DODGE JOINT VENTURE
SHASTA COPPER BELT EXPLORATION

GEOLOGIC LOG

Collar Elevation 3520.6
Total Footage 1760'
Logged By CPM, RBL, WJW
Date Completed 10-22-57

From	To	Core Recovery	Type	Rock Description	Alteration	Metallization	
						Cpy veinlet 1323	
1328	1367	95%	1-4mm	Gray, green 1-3mm rhy; Chl. clots, remnants of feldspar phenos. Crackled at 1341 Gradational from 1342 into rock with fewer qz. and more feldspar & chl.	Silicified	Zone of heavy sulf. conc. at contact. Scattered pyrite less than in np above.	40° 50° 60° 55°
1367	1378		NP frag.	Np rhy with about 15% finely granular; gray green		Scattered sulfide, no visible cpy. 6" heavy sulf.conc.1374'	60°
1378	1385		1-3mm	Gray-gr. Qz.smwt.resorbed.Locally chl.blebs,becoming more abundant.	Intensely silicif.	Scattered sulfides	
138[illegible]	1388		NP	Gray-gr. Gran.chl.frags.& blebs.	Minor sil	"	
1388	1563		1-3mm	Gray,green; chl. blebs Qz. partially resorbed Somewhat fractured Dark green patches either chl.or Qz. Strongly crackled 1415-1423 Local secondary quartz; & feldspar and intensely silicified from 1425-1433 More granular 1-3mm; with resorbed qz. & secondary silica. from 1433			50° 60° 50° 45°



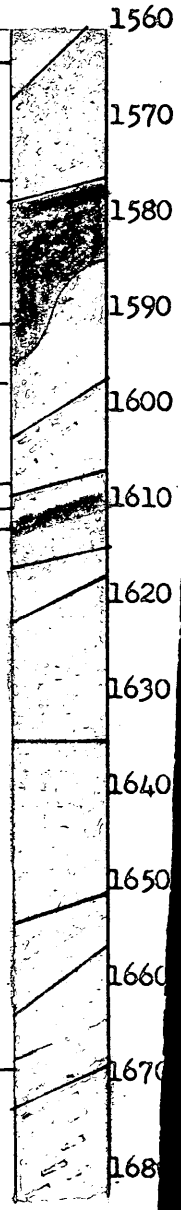
SHASTA-PHELPS DODGE JOINT VENTURE
SHASTA COPPER BELT EXPLORATION

GEOLOGIC LOG

Hole No. S-1 Sheet No. 14
Coordinates. 494861.7 N 1859221.3 E
Type Drill DD Bit Size NX, BX, AX
Date Started 9-5-57

Collar Elevation 3520.6
Total Footage 1760'
Logged By CPM, RBL, WJW
Date Completed 10-22-57

From	To	Core Recovery	Type	Rock Description	Alteration	Metallization	
1563	1576		Green-stone	Dark blue, black greenstone or frag. NP, no obs. qz. Mottled appearance 1571' inclusion of np rhy 6" long	Silicified	Scattered sulfide Contact flat	45°
1576	1591		NP	Gray green; med. grained np. Secondary qz; no phenos. Locally sparse phenos.		Scattered py. 1582 -6" mod. sulf. conc.; crackled Contact 20° to core	
1591	1597		1-3mm	Lt. gray; abun. chl. blebs; silicified 6" strong sulf. at contact.			
1597	1608		Green-stone	Dark, gray, green, mostly just chl. frags. in lighter matrix. Sharp contact with underlying rock.	Silicified	Mod. sulfides Conc. in veinlets	45°
1608	1611		1-3mm	Lt. gray; chl. frags & grstn. frags; qz. vlnts	"	Very scare sulfide	
1611	1613		NP	Lt. gray grn; gran. matrix; crackled	Shadowy chl. frags.	"	
1613	1669		1-3mm	Lt. green; very fine grained chl. frags; crackled; grades into por. with strongly resorbed qz. phenos. at about 1620'. 1616-1618 rock is more granular, fewer phenos. End of granular rock at 1637'; thereafter more fine grained sil. Crackled at 1659 Scattered frags. of greenstone.	Intensely silicified	" Small sulf. vlnts. Minor scattered py.	75° 65° 90° 70° 55°
1669	1711	85%	Green-stone	Dark blue green; feldspar & ferro minerals, mottled color; weakly fragmental	Silicified Epidote patches, Probably as vesicle filling	Mod. py. mnlx, no cpy.	65°



Hole No. S-1 Sheet No. 13
Coordinates. 494861.7 N 1859221.3 E
Type Drill DD Bit Size NX, BX, AX
Date Started 9-5-57

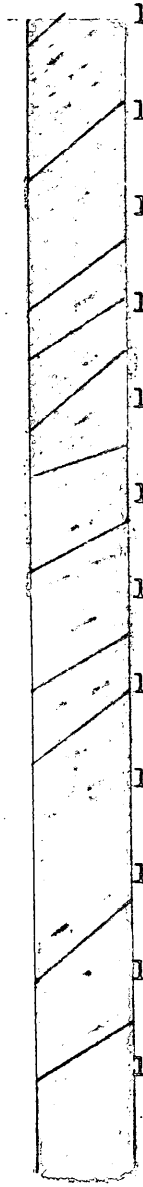
SHASTA-PHELPS DODGE JOINT VENTURE
SHASTA COPPER BELT EXPLORATION

GEOLOGIC LOG

Collar Elevation 3520.6
Total Footage 1760'
Logged By CPM, RBL, WJW
Date Completed 10-22-57

From	To	Core Recovery	Type	Rock Description	Alteration	Metallization	Angle to Core
			1-3mm	6" of crackled zone and moderate py at 1454		Scattered sulfides	
				1450-1460 zone of sparse qz. phenos.			50°
				Abundant chlorite blebs			
							55°
				Feldspar altered and vague			55°
						Scattered sulfide No visible cpy.	50°
							70°
							65°
				Locally more chl. blebs Crackled 6" zone at 1501			
							55°
							50°
						Scattered sulfides	
							50°
				1545-1547 Zone of med. grained matrix			55°

Section



Hole No. S-1 Sheet No. 15
Coordinates. 494861.7 N 1859221.3 E
Type Drill DD Bit Size NX, BX, AX
Date Started 9-5-57

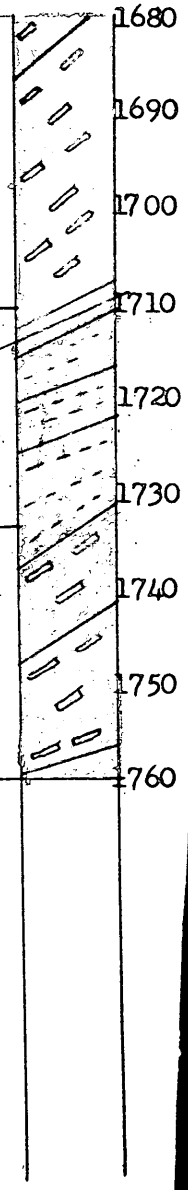
SHASTA-PHELPS DODGE JOINT VENTURE
SHASTA COPPER BELT EXPLORATION

GEOLOGIC LOG

Collar Elevation 3520.6
Total Footage 1760'
Logged By CPM, RBL, WJW
Date Completed 10-22-57

From	To	Core Recovery	Type	Rock Description	Alteration	Metallization	Angle to Core
			Green-stone	Greenstone generally mod. fractured	Strongly sil. locally	1691'-6" of heavier sulf. conc., no cpy.	50°
1711	1734	100%	1-3mm rhy.	Lt. gray, green; coarse qz; chl. blebs abundant; no feldspar phenos; Some qz. phenos fractured and broken Chl blebs more abun. from 1714		Py vlnts // to core; scattered py.	62° 65° 70°
1734	1760	100%	Green-stone	Same as greenstone above Locally strongly fractured Abundant epidote patches; mottled; fractured. BOTTOM OF HOLE 1760'		Scattered py. Moderate py.	55° 60° 75°

Section



DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
4/15	Griswold	500
4/15	GCS	130
		~~730~~
		~~730~~
4/15	[illegible]	110
	Wittendorf	120
4/26	C	220
		500

APR 15 1958

W. R. Griswold/er Rm 4444, 3669

TELEGRAM

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

DMEA - Division of Base Metals

14X4401(01) Revolving Fund,
Defense Production Act, Interior,
(Transfer to Office of Secy.)

DATE:

TO: Mr. S. Ricker
Executive Officer
DMEA Field Team, Region II
1605 Evans Avenue
Reno, Nevada

Reurtel April 14 re Docket DMEA-4786 Shasta Phelps Dodge Joint Venture application is in process, probably we can give you something definite in about two weeks.

George C. Selfridge

Chairman, Operating Committee (GB)

WRGriswold/er 4/15/58
Copy to: Docket
Admr R File
Op. Committee
Mr. McMahon, USBM
Mr. Kiilsgaard, USGS
Chron.

8623

CLASS OF SERVICE

This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION TELEGRAM

W. P. MARSHALL, PRESIDENT

1201

SYMBOLS

DL = Day Letter

NL = Night Letter

LT = International Letter Telegram

The filing time shown in the date line on domestic telegrams is STANDARD TIME at point of origin. Time of receipt is STANDARD TIME at point of destination

HC7

OB165

O REB005 GOVT NL PD=RENO NEV 14= 1958 APR 14 PM 7 39

:OPERATING COMMITTEE DEFENSE MINERALS EXPLORATION=

ADMIN INTERIOT BLDG WASHDC=

OPERATOR EXPECTS TO RESUME WORK ON DOCKET NBR DMEA-4092 CONTRACT NBR IDM-E1006, IMMEDIATELY AND IS DESIROUS OF KNOWING STATUS OF DOCKET NBR DMEA-4786 SO THAT PREPARATORY WORK ON BOTH PROJECTS CAN BE DONE MORE EFFICIENTLY AND AT LESS COST. WOULD APPRECIATE TELEGRAPHIC REPLY=

S RICKER==

NBR DMEA-4092 NBR IDM-E1006 NBR DMEA-4786=.

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

OFFICIAL FILE COPY
DMEA

RECEIVED APR 15 1950

DATE	INITIALS	CLOCK
4/15	C	220
4/15	Cortez	500

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code

500

April 8, 1958

Memorandum

To: A. D. McMahon, Bureau of Mines

From: Director, Division of Base Metals

Subject: Comments on Docket No. DMEA-4786 (Copper-Zinc)
Shasta-Phelps Dodge Joint Venture
Sugar Loaf Area
Shasta County, California

We are attaching, for your comments, the memorandun of Mr. Ricker dated March 21, 1958, with enclosures. Since only one copy of some of the material is available, will you kindly review it and return it to us with your comments.

Please note the memos of December 5 and 6, 1957, by N. E. Nelson and the Chairman's letter of December 16, 1957.

W. R. Griswold

W. R. Griswold

WRG/er
Copy to: Docket
Chron.

8623

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code

500

March 25, 1958

Memorandum

To: Thor Kiilsgaard, U. S. Geological Survey

From: Director, Division of Base Metals

Subject: Comments on Docket No. DMEA-4786 (Copper-Zinc),
Shasta-Phelphs Dodge Joint Venture
Sugar Loaf Area
Shasta County, California

We are attaching, for your comments, the memorandum of Mr. Ricker dated March 21, 1958, with enclosures. Since only one copy of some of the material is available, will you kindly review it and return it to us with your comments, so we may then forward the material to Bureau of Mines for review.

Please note the memos of December 5 and 6, 1957, by N. E. Nelson and the Chairman's letter of December 16, 1957.

W. R. Griswold

W. R. Griswold

WRG/er
Copy to: Docket
Chron.

8623

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
12/13	Krisnoff	500
12/13	[illegible]	130
"	Johnson	110
"	[illegible]	100
		~~HB~~
12/16	[illegible]	220
		500

500

DEC 16 1957

Mr. Spangler Ricker
Executive Officer
DMEA Field Team, Region II
1605 Evans Avenue
Reno, Nevada

Re: Docket No. DMEA-4786 (Copper-Zinc)
Shasta-Phelps Dodge Joint Venture
Sugar Loaf Area
Shasta County, California

Dear Mr. Ricker:

We have your memorandum dated November 26, with the enclosed Field Team report on the cited application. Rather than taking any action here at this time we are referring the application back to you for further review.

We call your attention to the enclosed memoranda dated December 5 and 6, 1957, by N. E. Welson, Geological Survey. Please note the various points which have been brought up; geological mapping of the accessible underground workings, log of the presently existing diamond drill hole, the possibility of doing angle drilling, etc. Since this application could involve the commitment of a substantial amount of Government funds, we should have all possible background data prior to taking any positive action.

We also call your attention to the enclosed memorandum dated December 6, 1957, by A. D. McMahon, Bureau of Mines. We are in full accord with his contention that the "Personal Services" category is out of line. With the indicated slow drilling rate (about a thousand feet monthly), adequate supervision could be provided by the full time geologist; the items of supervisor, two engineers, and drill foreman, could easily be eliminated. Likewise, item "3 "Butler steel buildings" seems a bit excessive. It would seem that two such buildings should assuredly be adequate.

8623

We would be reluctant to accept the item of $16,000.00 for 20,000 feet of access roads. This is a cost of almost $5,000.00 per mile, which we consider to be unwarranted. The drill holes contemplated are of no great depth and do not require heavy equipment. In many of our projects, where roads are not available, skid-mounted units are being used and no access construction is required other than something in the nature of a forest trail. We realize that the area in question is one of rugged terrain and, obviously, some preliminary expense would be necessary, but such expense should be kept to a minimum.

We note that the item "Independent Contracts" allocates $8.75 per foot, whereas projects DMEA-3590 and DMEA-4092 used around $7.00 and $7.60, respectively, for this account.

We further note that no delineation is made for the proposed drilling under Stage I. We realize that certain projects must be progressively planned, depending upon day-to-day results, but we require that at least the initial skeletonized drilling be shown in the contract.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (GCS)

Enclosures

APPROVED:

Frank D. Lamb

Member, Bureau of Mines (GCS)

N. E. Nelson

Member, Geological Survey (GCS)

WRGriswold/er 12/13/57
Copy to: Docket
Admr R File
Op. Committee
Mr. McMahon, USBM
Mr. Kiilsgaard, USGS
Chron.

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DMEA
RECEIVED DEC 9 1957
INITIALS | CODE
gb | 220
12/9 WRG | 500

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

December 6, 1957

Memorandum

To: W. R. Griswold, Defense Minerals Exploration Administration

From: Commodity Specialist, Branch of Base Metals

Subject: Review of Application Report, Docket No. DMEA 4786 (copper-zinc), Shasta-Phelps Dodge Joint Venture, Sugar Loaf Area, Shasta County, California. $209,742.00

The field examination of the Sugar Loaf Area and an evaluation of the applicant's proposed exploration program by the examiners resulted in their recommendation of Government participation in the drilling project as outlined in the application.

The recommended project has been divided into two stages consisting of 5 holes totaling 4,360 feet followed by 15 holes aggregating 13,080 feet. The total cost of the project developed by the examiners under "Detailed Cost Estimate" is substantially below that estimated in the application.

It appears that an additional substantial reduction in costs could be made under the category of "Personal Services" where the employment of a supervisor, two engineers, a geologist, and a drill foreman seems unwarranted for the work outlined. Otherwise, I concur in the examiners recommendation.

A. D. McMahon

A. D. McMahon

Copy to: Division of Minerals
Branch of Base Metals (2)
Thor Kiilsgaard, U.S.G.S.
F. D. Lamb
Files

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

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DMEA
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12-9	C	220
12/9	URG	500

December 6, 1957

Memorandum

To: W. R. Griswold, Defense Minerals Exploration Administration

From: N. E. Nelson, U. S. Geological Survey

Subject: DMEA Docket 4786, Shasta-Phelps Dodge Joint Venture, Shasta County, California, Field Team Report

My memo re the Shasta-Phelps Dodge Field Team Report has been read by A. R. Kinkel, Jr.

Art thinks I overstressed the middle member element, as he admits as said in the Professional Paper, they were unable to classify the rhyolite satisfactorily.

Art would prefer angle holes to vertical in order to cut the foliation at a larger angle. He does not expect flat lying orebodies in that area.

Art thinks the underground workings should have been mapped with which thought I agree. Also, the drill hole should have been logged.

He expressed himself pointedly concerning the inferred 1,000,000 tons of 4% copper ore. Both the tonnage and grade figures are too optimistic.

N. E. Nelson

N. E. Nelson

1 cpy
P9

IN REPLY REFER TO:

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

12/5	C	220
12/6	DMEA	500

December 5, 1957

Re: DMEA 4786
Shasta-Phelps Dodge Joint Venture
Sugarloaf Mountain prospect
Shasta County, California
Applicant's Estimate $270,291.58
Examiner's Estimate $209,742.00
Copper

Memorandum

To: W. R. Griswold, Defense Minerals Exploration Administration

From: N. E. Nelson, U. S. Geological Survey

Subject: Review of Field Team Report

The applicants requested assistance in prospecting, by 17,440 feet of diamond drilling, for blind copper-zinc orebodies.

Except for a lowering of the estimated unit cost of the drilling, the examiners recommend approval of the application.

Probably since the application was filed the applicants have drilled a hole on a ridge about 400 feet from the northwest end of the proposed "C" fence. No map is given showing the location. The hole cut porphyritic and non-porphyritic rhyolite to a depth of 1,720 feet at which depth the Copley greenstone was entered.

The hole, when plotted on the "C" section of Exhibit "E" of the application, indicates that the proposed holes in the "C" fence will have to be drilled up to 500 feet deeper in order to enter the greenstone if the contact is as shown. The dip of the southeast rhyolite-greenstone contact is probably very steep judging from the almost straight surface trace of the contact as it crosses ridges and draws. Probably all of the sections should be redrawn using information now available in order that a more realistic estimate of the drilling footage may be made.

More exact information concerning the rocks and sulfides cut in the recently drilled hole could be of interest. The geological map of Professional Paper 285* shows the hole would collar in the unfavorable bottom member rhyolite and probably remain in

*Geology and Base-Metal Deposits of West Shasta Copper-Zinc District, Shasta Co., Calif., by A. R. Kinkel, Jr., W. E. Hall, and J. P. Albers.

it as, except for two narrow remnant strips of middle member rhyolite, the bottom member extends southeasterly to the steeply dipping greenstone. It would be well to know if any middle member rhyolite was identified in the core, as, according to the Professional Paper, all the worthwhile copper-zinc orebodies of the District occur in the middle member of the rhyolite series.

Unless the middle member is present, it appears most unlikely blind copper-zinc orebodies will be found in the project area. Concerning the area, the Professional Paper says, page 102:

"The area under Sugarloaf Mountain between the Busy Bee workings at the northeast end of the Iron Mountain orebodies and the Sugarloaf mine probably contains massive sulfide bodies. However, the character of the ore in the Busy Bee workings and the Sugarloaf mine suggests that these sulfide bodies contain very little copper or zinc, and the topography makes exploration by drilling difficult."

That it could be much more difficult and expensive than intimated by the application is now apparent.

Another estimate of drilling footages and costs based on redrawn sections is in order. I recommend that a request for such be made.

N. E. Nelson

N. E. Nelson

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

1605 Evans Avenue
Reno, Nevada

November 26, 1957

Memorandum

To: Operating Committee, DMEA, Washington, D. C.

From: Acting Executive Officer, DMEA Field Team, Reg. II

Subject: Docket DMEA-4786 (copper-zinc)
Shasta-Phelps Dodge Joint Venture
Sugar Loaf Area
Shasta County, California

Please refer to your letter of July 26, 1957, requesting a field examination.

Enclosed are four copies of a report by J. D. Warne and H. K. Stager recommending a $209,742.00 project in two stages.

Mr. Ricker and I concur in the recommendation.

Roscoe M. Smith
Roscoe M. Smith
Acting Executive Officer

Attachment

Reviewed by
DMEA OPERATING COMMITTEE
12-4-57
(date)

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11/29	gb	220
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		220

ON-SITE Report

UNITED STATES
DEPARTMENT OF THE INTERIOR
FRED A. SEATON, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION II

APPLICATION REPORT

DMEA-4786 (copper-zinc)
Shasta-Phelps Dodge Joint Venture
Sugar Loaf area, West Shasta district
Shasta County, California

by

J. D. Warne
U. S. Bureau of Mines

H. K. Stager
U. S. Geological Survey

November 18, 1957

Reviewed by
DMEA OPERATING COMMITTEE
12-4-57
(date)

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ILLUSTRATIONS

Figure 1 . . . . . Index map

INTRODUCTION

The Shasta-Phelps Dodge Joint Venture, Box 857, Redding, California, applied to the Defense Minerals Exploration Administration, docket DMEA-4786, for Government assistance in a program to explore for copper and zinc in the Sugar Loaf area of the West Shasta district, Shasta County, California (fig. 1).

A field examination was requested by the Operating Committee and was made by J. D. Warne, U. S. Bureau of Mines, and H. K. Stager, U. S. Geological Survey, on August 28 and October 9, 1957, accompanied by Mr. W. J. Walker, supervisor, representing the applicant. A conference was held in Redding on November 6, 1957 to reach an agreement on the applicant's request to divide the project into two stages.

An inspection was made of the proposed project area and the applicant's maps were compared with exposures in the field. The geology of the district has been described in detail by Kinkel and Albers[1/], Kinkel and Hall[2/], Kinkel, Hall, and Albers[3/], and McKinstry and Jarrell[4/]. The geology was also summarized in two previous DMEA

1/ Kinkel, A. R., Jr., and Albers, J. P., 1951, Geology of the massive sulfide deposits at Iron Mountain, Shasta County, Calif: Calif. Div. of Mines Sp. Rept. 14.

2/ Kinkel, A. R., Jr., and Hall, W. E., 1951, Geology of the Shasta King mine, Shasta County, Calif: Calif. Div. Mines Sp. Rept. 16.

Kinkel and Hall, 1952, Geology of the Mammoth mine, Shasta County, Calif: Calif. Div. Mines Sp. Rept. 28.

3/ Kinkel, A. R., Jr., Hall, W. E., and Albers, J. P., 1956, Geology and Base-Metal Deposits of West Shasta Copper-Zinc District, Shasta County, California: U. S. Geol. Survey Prof. Paper 285.

4/ McKinstry, H. E., and Jarrell, O. W., Geology and Ore Deposits Iron Mountain-Mammoth Belt, Shasta County, Calif: unpublished private report.

---

application reports (dockets DMEA-3590, Shasta King mine, and DMEA-4092, Balaklala mine). This summary, with but a few modifications, is repeated in this report. No attempt was made to remap any of the area and, inasmuch as there are no known mineralized exposures in the proposed project area, no samples were taken.

CONCLUSIONS AND RECOMMENDATIONS

Investigations by the Geological Survey and the applicant, production records for the nearby mines and the district, and inferred reserves of about one million tons of copper-zinc ore indicate that the proposed exploration of the Sugar Loaf area is warranted.

Experience gained, by the applicant, from a recently completed 1760-foot diamond-drill hole in the area to be explored and from two other DMEA drilling projects in the district will be of value in guiding the proposed exploration and will greatly increase the efficiency of the work. The proposed program consisting of 20 diamond-drill holes, totaling about 17,440 feet, is adequate to explore the most favorable part of the Sugar Loaf area and the applicant is well qualified to do the work. The project site is readily accessible during about eight months of the year and facilities for accomplishing the work are available. The program will require two years to complete and the Government's share of the estimated total cost of $209,742.00 would be $104,871.00.

It is recommended that the Government enter into a DMEA contract with the Shasta-Phelps Dodge Joint Venture to provide 50 percent of the costs of the program. To facilitate administration of the contract the work should be based on unit costs rather than actual costs.

LOCATION, ACCESSIBILITY, AND LOCAL RESOURCES

The area to be explored is in secs. 23, 24, 25, and 26, T. 33 N., R. 6 W., M.D.B.&M., within the West Shasta copper-zinc district, Shasta County, California, on the east side of Sugar Loaf Mountain, a part of the rugged Klamath Mountain Range. The area lies about seven miles northwest of Redding, California, and about five miles southwest of Shasta Dam at an altitude of about 2,500 feet (fig. 1).

From Redding the area is reached via the Iron Mountain mine surfaced road that branches north from U. S. Highway 299-W about 3 miles west of Redding. From the Iron Mountain mine an improved tramway service road is followed to a divide between Boulder and Spring creeks, then a dirt access road leads up the southeast flank of Sugar Loaf Mountain to the area. The total distance by road from Redding is about 10 miles. During the dry seasons of the year the area is also accessible from Shasta Dam via dirt mine access and logging roads leading south from the Shasta King, Balaklala, and other mines.

Climate--heavy rainfall and snow above an altitude of 1,500 feet prevents surface operations during winter months.

Labor--available from the Redding area, a distance of about 10 miles.

Water and Electric power--water sufficient for the diamond drilling is on the property. Power will be generated by diesel or gasoline engines.

Mail service and Telephone--mail: P. O. Box 857, Redding, California, project office at Montana and Shasta Dam Boulevard, Central Valley, California. Telephone: CRestwood 5-2575.

Supplies--obtainable from the Redding or San Francisco areas.

Rail and Freight services--at Redding. The nearest shipping point is Matheson on the Shasta Dam branch of the Southern Pacific Railroad.

HISTORY, DEVELOPMENT, AND PRODUCTION

The Sugar Loaf mine prospect, formerly known as the Galvin mine, was originally located about 1880; and 1,300 feet of prospect adits had been driven by 1902. Total underground development consists of 12 adits aggregating 4,365 feet. The applicant's Exhibit "C" shows the locations of the main underground workings, of which adits "A", "C", and "D" are still open, adit "B" is inaccessible, and adit "E" has recently been re-opened by the applicant.

No ore has been produced from the Sugar Loaf area. The district has yielded a total of about eight million tons of copper-zinc ore that contains 2 to 7.5 percent copper, 2 to 20 percent zinc, 0.001 to 0.1 ounce gold, and 0.4 to 8.2 ounces of silver per ton. The Iron

Mountain mine, that adjoins the Sugar Loaf area on the southwest, has produced about three million tons of copper-zinc ore and six million tons of pyrite and gossan ores that were mined for the sulfur, gold, and silver content.

PROPERTY AND OWNERSHIP

The property is held under a joint venture agreement, dated July 1, 1956, by two corporations, Phelps Dodge Corporation and Shasta Minerals and Chemical Corporation, known as Shasta-Phelps Dodge Joint Venture. The mining claims were originally acquired by a lease and option from the Walker Engineering Corporation. Copies of leases and agreements between the applicants are included in the application. Also included are maps showing the area defined as the "West Shasta Copper Belt", the location of the Sugar Loaf area, Exhibit "B"; a Property Map of the Sugar Loaf area, Exhibit "C"; and a Property Map of the district.

Five groups including 61 patented mining claims and 16 unpatented mining claims are listed in the exploration project application. Exhibit "D" illustrates the property and locations where work is proposed.

Operations of the Shasta-Phelps Dodge Joint Venture are directed by a joint board consisting of Walter C. Lawson, William Evans, and George Swanson for Phelps Dodge Corporation; by K. L. Stoker for Shasta Minerals and Chemical Corporation; and by W. J. Walker of

Walker Engineering Corporation. Mr. Walker is in charge of all exploration in the district for the applicants.

GEOLOGIC SETTING

The rocks in the West Shasta copper-zinc district consist of a thick series of lava flows and pyroclastic rocks that are overlain by sedimentary formations. The Copley greenstone, consisting of mafic flows and pyroclastics of probable Lower or Middle Devonian age, is the oldest formation exposed in the district. It is a fine-grained greenish rock composed of albite, chlorite, and minor epidote. The Copley is overlain by silicic flows and pyroclastics of the Balaklala rhyolite of Middle Devonian age which contain the ore bodies. The Balaklala is overlain by the Kennett formation of Middle Devonian age which is principally shale, limestone, and minor tuff. The Kennett formation is overlain by shales, sandstones, and conglomerates of the Bragdon formation of Upper Devonian and Mississippian age. No sedimentary formations younger than the Bragdon are found in the immediate vicinity of the district. The Copley greenstone and Balaklala rhyolite are intruded by two masses of granitic rock, which are overlain by Lower Cretaceous strata a few miles southwest of the district. About 4 miles northeast of

the Sugar Loaf area a volcanic neck of porphyritic rhyolite cuts all the formations as high as the middle Balaklala and is probably the source of the upper Balaklala rhyolite.

The Balaklala rhyolite, which has a thickness of about 3,500 feet in the central part of the district, consists of light-colored porphyritic and non-porphyritic rhyolite flows intercalated with coarse- and fine-grained rhyolitic pyroclastics. Some of the rhyolite is amygdaloidal, and locally it is flow banded. The formation is divided into three units. The lower unit is the thickest and most extensive and is mainly non-porphyritic rhyolite, rhyolite tuff, and breccia. The middle unit ranges from a few feet to 800 feet in thickness, and consists mainly of porphyritic rhyolite flows with 1 to 4 mm quartz and albite phenocrysts, referred to as the medium phenocryst rhyolite, but it also contains some flows of non-porphyritic rhyolite. The upper part of the middle unit contains abundant pyroclastic layers, and the ore deposits occur as replacement bodies in medium phenocryst rhyolite under any of the pyroclastic beds in this horizon. The upper Balaklala unit is coarsely porphyritic rhyolite with quartz and albite phenocrysts over 4 mm in diameter. A thin bed of tuff or fine volcanic breccia is present nearly everywhere at the base of the upper Balaklala unit.

Mapping and diamond drilling by the applicant has shown that the middle and upper units of the Balaklala formation are not separable in the Sugar Loaf area. A test hole drilled on the ridge northeast of Sugar Loaf peak cut porphyritic and non-porphyritic rhyolite to a depth of 1,720 feet where the Copley greenstone was intersected. Mapping on the surface and in the underground prospect adits has also shown this to be true.

The rocks in the West Shasta district are broadly folded and locally sheared. The main structural features are a northeast-trending broad anticline and flanking synclines. The anticline is gently domed, and has its culmination in the central part of the district. The ore deposits are localized along the axes of minor anticlines, synclines, domes, and basins that are superimposed on the broad anticline.

Faults, both pre-mineral and post-mineral, are conspicuous in underground exposures, but are difficult to recognize on the surface. Most of these are high angle normal faults but some are reverse. The pre-mineral faults contain iron oxides, hydromica, and clay minerals near the ore bodies. Almost all of the faults have had post-mineral movement, some as much as several hundred feet vertically and horizontally.

ORE DEPOSITS

The ore deposits of the West Shasta district are massive sulfide replacement bodies in the middle unit of the Balaklala rhyolite. The ore bodies that have been mined lie in channels trending northeasterly through the district, along the crests and troughs of the minor folds.

The copper-zinc deposits occur as massive pyrite bodies that contain chalcopyrite and sphalerite, and some gold and silver. The copper content ranges from about 2.0 percent to 7.5 percent, the zinc from 2.0 percent to 21.1 percent, the silver from 0.04 to 8.2 ounces, and the gold from a trace to 0.1 ounce per ton. Gangue minerals, other than pyrite, are almost absent. Some quartz, sericite, clay minerals, and unreplaced rhyolite are present in the ore and the content of these insoluble materials ranges from 3.5 to 35.5 percent and averages about 15 percent. The massive ore is commonly separated from barren wall rock by a thin selvage of gouge; gradational contacts between ore and wall rock are not common.

Most of the ore bodies in the district are lenticular and flat lying although the ore body at the Iron Mountain mine is steeply dipping. All of the bodies that have been mined cropped out at the surface. The bodies range in size from small bodies only a few feet across to the large ore body at the Iron Mountain mine which, before

post-mineral faulting, was 4,500 feet long, several hundred feet wide, and over 100 feet thick. The major part of the more than eight million tons of ore produced from the district has been obtained from three deposits; the Balaklala mine that has yielded more than one million tons of ore, and the Mammoth and Iron Mountain mines that have each yielded more than three million tons of copper-zinc ore. The Iron Mountain mine has, in addition, yielded more than six million tons of pyrite and gossan ores that were mined for the gold, silver, and sulfur content. Deposits of this average size and grade are the targets of the proposed exploration.

Although there are no exposed ore deposits in the Sugar Loaf area the structure and lithology are similar to that in the Iron Mountain mine area that adjoins the property on the southwest. The proposed project area is along the trough of a syncline that is on the southeast flank of a larger and deeper syncline that strikes northeast along the west side of Sugar Loaf Peak. Foliation in the Balaklala rhyolite strikes northeast and dips steeply northwest and southeast. A northeast-striking fault, the Sugar Loaf fault, cuts the rocks near the axis of the syncline, contains pyrite and could have served as a feeder for the mineralizing solutions. Numerous mineralized zones of rhyolite, some containing chalcopyrite and massive pyrite, were cut by the test

hole drilled about 400 feet northwest of the end of the proposed "C" row of holes (Exhibit D). Although these mineralized zones contained only about 0.1 percent copper they are indicative of the content of the mineralizing solutions and may indicate the proximity of minable ore bodies.

SAMPLING

Inasmuch as there are no known exposures of copper-zinc ore in the Sugar Loaf area no samples were taken by the examiners. The grade of the reserves inferred for the proposed project area is based on the records of production from other nearby mines in the district.

ORE RESERVES

There are no measured or indicated ore reserves in the Sugar Loaf area. There has been no ore produced and none is exposed.

The copper-zinc ore bodies of the West Shasta district range in size from about 5,000 tons to 3,000,000 tons and contain from about 2 percent to 7.5 percent copper, 2 percent to 20 percent zinc, and 1 to 8 ounces of silver per ton. The Sugar Loaf area lies between the Iron Mountain mine on the south, that has yielded about 3,000,000 tons of copper-zinc ore, and the Keystone and Stowell mines on the north that have yielded about 100,000 tons of ore each. It is inferred that the Sugar Loaf area contains one or more major ore bodies of this type

and that exploration may discover reserves totaling about 1,000,000 tons of ore that averages about 4 percent copper, 5 percent zinc, one ounce of silver, and 0.04 ounce of gold per ton.

THE EXPLORATION PROJECT

The applicant proposes to explore, by surface diamond drilling, the mineralized area southeast of Sugar Loaf Mountain. He states that work can begin within 30 days from the date of the contract, and that it can be completed in two drill seasons, or two calendar years. No work is planned in the area during the winter months of December, January, February, or March, which would allow 16 months to perform the work within a 24-month period providing the project can begin during April, or within the early part of the drilling season.

All of the proposed drill holes are vertical from surface locations shown on the map attached to the application (Exhibit "D"). The recommended quantity, locations, and pattern, or grid of holes, is the same as that proposed by the applicant, which consists of four rows of holes spaced 1,000 feet apart, and five holes along each row at 300-foot intervals. Twenty vertical holes are proposed and recommended, having an aggregate length of 17,440 feet. The area

8004

to be explored is 4,000 feet long and 1,500 feet wide.

The exploration area is extremely rugged and individual holes along a single row of holes differ in elevation as much as 600 feet. In most cases access roads into each drill site will be required to permit drilling of the desired pattern.

The order of drilling holes should be made flexible allowing the operator to perform work in the most logical and economical manner; with any changes in the locations subject to prior approval of the Government. Estimated depths of holes along the four proposed rows of holes shown in Exhibit "E" of the application are as follows:

ROW "A"

Hole No.	Estimated depth (ft.)
1	490
2	900
3	960
4	940
5	930
	4,220

ROW "B"

Hole No.	Estimated depth (ft.)
6	1,040
7	1,130
8	1,080
9	860
10	610
	4,720

ROW "C"

Hole No.	Estimated depth (ft.)
11	990
12	850
13	790
14	760
15	780
	4,170

ROW "D"

Hole No.	Estimated depth (ft.)
16	1,330
17	1,150
18	920
19	640
20	290
	4,330

Total estimated amount of drilling: 17,440 feet.

The applicant has requested, and we recommend, that the program be divided into two stages: Stage I to consist of five holes, or not more than 4,360 feet of drilling, and Stage II to consist of fifteen holes, or 13,080 feet of drilling plus any unused footage remaining from Stage I. The holes to be drilled under Stage I should be in the areas and at the sites determined, by the applicant and the Field Team, to be the most favorable geologically. The order of drilling and exact location of each drill site is to be agreed upon in advance and is to be based upon the detailed surface mapping of the area by the applicant and the results obtained from each completed hole.

EXPLORATION COSTS

Cost estimates of diamond drilling are based upon actual contract drilling costs in the Shasta King, Balaklala, Early Bird, and Sugar Loaf mine areas. Additional cost information was obtained from a conference, on October 9, 1957, with Mr. W. J. Walker, project supervisor, and from Mr. T. M. Welsch, general field superintendent for R. S. McClintock Diamond Drill Co. (drilling contractor on Shasta-Phelps Dodge Joint Venture project, DMEA-4092, contract Idm-E1006).

According to the applicant, the average contract cost of nearly 10,000 feet of contract drilling in the Shasta King and Balaklala mine areas, to date, has been about $8.75 per foot. An average contract

cost of $8.79 per foot of diamond drilling, for 1,076 feet of hole, was charged by the contractor for hole No. S-1. This hole was recently drilled at the operator's expense in the Sugar Loaf area to a total depth of 1,760 feet. The above costs included casing requirements, reaming, cementing, and other extra items connected with drilling; but it would be impossible to determine in advance whether this contract cost for a single hole would be an average cost for the total drilling planned in the Sugar Loaf area. The applicant submitted proposals on July 11, 1957, from five drilling contractors upon which cost estimates for diamond drilling can also be based. Due to the scope of the new proposed program, a cost of $8.75 per foot is estimated as the probable cost of drilling rather than $9.50 per foot which is used by the applicant.

Detailed Cost Estimate

		Cost per ft.	Total cost
(1)	Independent Contracts		
	17,440 ft. diamond drilling @ (cost/ft. includes drilling of AX size holes or larger, costs of casing, cementing, surveys, delays, and all other costs of drilling for which no schedules appear below)	$8.75	$152,600.00

	Cost	Total cost
(2) Personal Services		
1 Supervisor, 1/4 of $900.00/mo.	$225.00	
2 Engineers, 1/4 of $1250.00/mo.	312.00	
1 Geologist @ $550.00/mo.	550.00	
1 Drill foreman @ $600.00/mo.	600.00	
Total	$1,687.00	$26,992.00
(3) Operating Materials and Supplies		
700 core boxes @ $1.25/ea.	$875.00	
Gas and oil for water pump, 16 mos. @ $190.00/mo.	3,040.00	
Gas, oil, and grease for pick-up truck, 16 mos. @ $50.00/mo.	800.00	
4,000 ft. 1-in. black iron pipe with couplings	547.00	
Miscellaneous supplies	250.00	
Total		$ 5,512.00
(4) Operating Equipment (to be purchased by operator)		
Depreciation in lieu of rental		
1 pickup truck ($2400.00 value), 16 mos. @ $40.00/mo.	$640.00	
1 Gardner-Denver duplex pump, 800-lb. pressure, 50 gpm, ($3180.00 value), 16 mos. @ $53.00/mo.	848.00	
Total		$ 1,488.00
(5) Initial Rehabilitation and Repairs		
None		$ 0.00
(6) New Buildings, Fixtures, and Installations		
3 Butler steel buildings, with core racks, (size: 8 ft. by 10 ft.) @ $1000.00/ea.	$3,000.00	
20,000 ft. new access roads, including preparation of drill site stations, @ $0.80/ft.	16,000.00	
Total		$19,000.00

	Cost	Total Cost
(7) Miscellaneous		
Assay 500 samples, for copper and zinc, @ $1.50/ea.	$750.00	
Repair and maintenance of truck, pump, and other equipment, 16 mos. @ $50.00/mo.	800.00	
Payroll taxes, insurance, etc., 16 mos. @ $100.00/mo.	1,600.00	
Total		$ 3,150.00
(8) Contingencies		
Delays due to inclement weather		
Accounting, etc.		
Total		$ 1,000.00

Total estimated cost of the project $209,742.00

Government's share at 50 percent 104,871.00

Cost Summary

STAGE I	5 holes or 4,360 ft. of diamond drilling.	$52,435.50
STAGE II	15 holes or 13,080 ft. of diamond drilling	$157,308.50
	Total	$209,742.00

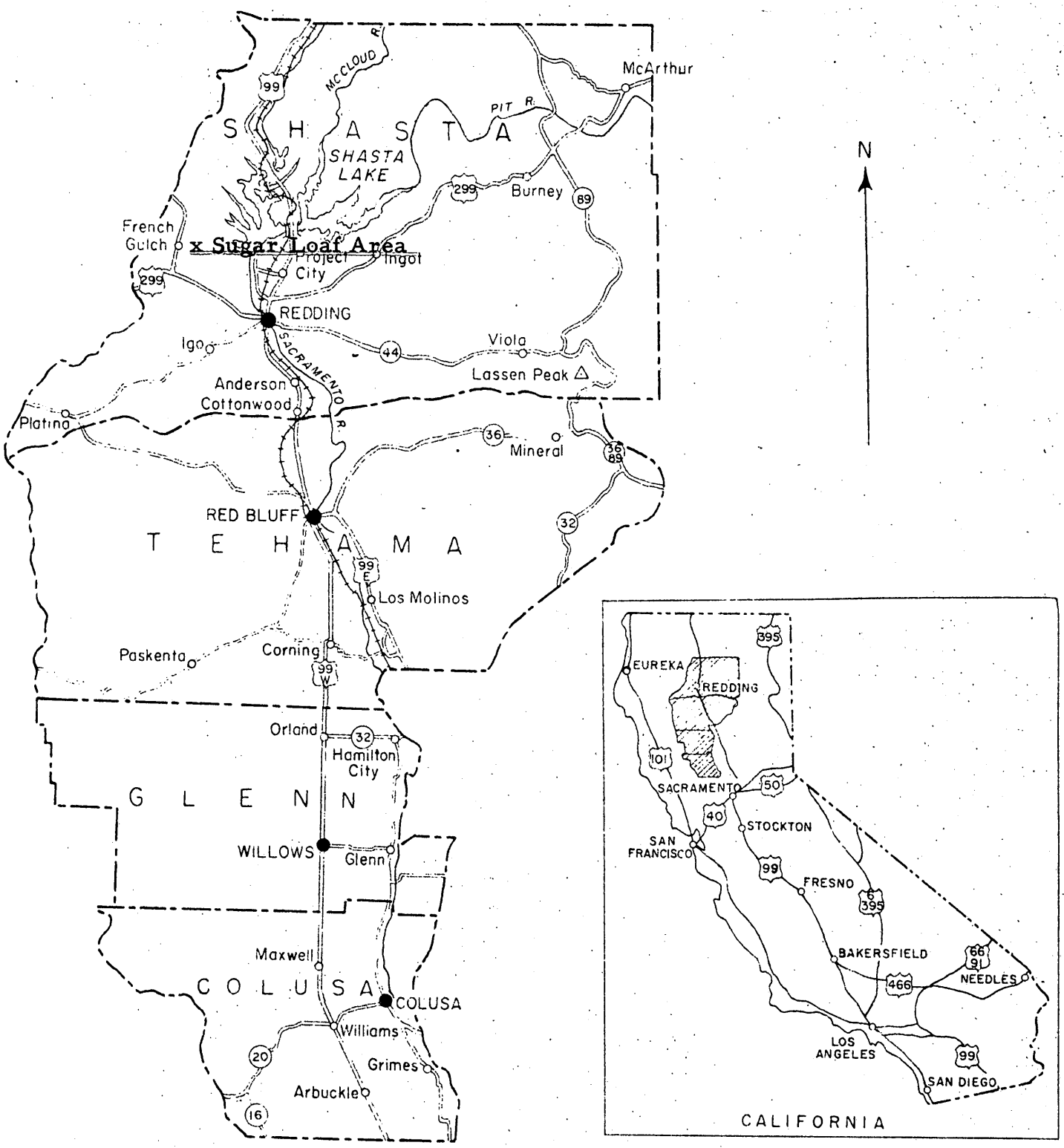


Figure 1. INDEX MAP OF SHASTA, TEHAMA, GLENN, AND COLUSA COUNTIES, CALIFORNIA

0 20 40 60 Miles

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
7/24	Griswold	500
7/26	Martin	130
"	Johnson	110
"	Mittendorf	100
7/26	C	225
		500

7/26 Lamb (130)
7/26 Kiilsgaard (130)

JUL 26 1957

Mr. W. J. Walker
Shasta-Phelps Dodge Joint Venture
Post Office Box 857
Redding, California

Re: Docket No. DMEA-4786 (Copper-Zinc)
Shasta-Phelps Dodge Joint Venture
Sugar Loaf Area
Shasta County, California

Dear Mr. Walker:

Your application for Government assistance to explore the cited property has been reviewed by the Division of Base Metals of the Defense Minerals Exploration Administration and is being referred to:

Mr. Spangler Ricker
Executive Officer
DMEA Field Team, Region II
1605 Evans Avenue
Reno, Nevada

If additional information concerning your application is needed, the Field Team will get in touch with you at an early date.

Sincerely yours,

C. O. Mittendorf

Administrator

WRGriswold/er 7/24/57
Copy to: Docket
Admr R File
Op. Committee
Mr. McMahom, USBM
Mr. Kiilsgaard, USGS
Chron.
Region II (2)

8623

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
7/24	Griswold	500
7/26	Martin	130
"	Johnson	110
"	Attendory	100
		225
		500

500

JUL 26 1957

Mr. Spangler Ricker
Executive Officer
DMEA Field Team, Region II
1605 Evans Avenue
Reno, Nevada

Re: Docket No. DMEA-4786 (Copper-Zinc)
Shasta-Phelps Dodge Joint Venture
Sugar Loaf Area
Shasta County, California

Dear Mr. Ricker:

The cited application is being referred to your office for consideration, a field examination of the property if warranted, and recommendations. Copies of memoranda dated July 19 and 23, 1957, by N. E. Nelson, Geological Survey, and A. D. McMahon, Bureau of Mines, respectively, relating to the project are enclosed for your information.

We are also enclosing an extra copy of the application for the use of the Field Team.

Sincerely yours,

W. S. Martin
ACTING Chairman, Operating Committee (245)
WRGriswold/er 7/24/57
Copy to: Docket
Admr R File
Op. Committee
Mr. Bishop, USBM
Mr. McMahon, USBM
Mr. Kiilsgaard, USGS
Chron.

Enclosures

APPROVED:

Frank D. Lamb (245)
Member, Bureau of Mines

Thor H. Kiilsgaard (245)
Member, Geological Survey

8623

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

OFFICIAL FILE COPY
DMEA
RECEIVED JUL 24 1957

DATE	INITIALS	CODE
7/24	P.K.	220
7/24	WRG.	500

July 23, 1957

Memorandum

To: W. R. Griswold, Defense Minerals Exploration Administration

From: Commodity Specialist, Branch of Base Metals

Subject: Review of application, Docket No. DMEA 4786 (copper-zinc), Shasta-Phelps Dodge Joint Venture, Sugar Loaf Area, Shasta County, California. $270,291.58

The applicant proposes to diamond drill and test certain horizons for copper and zinc bearing massive sulfide bodies believed to underlie an area 4,000 feet long by 1,500 feet wide in the Sugar Loaf mountain district. The proposed project consists of 20 diamond drill holes totaling 17,440 feet, 20,000 feet of new road, 3 small steel buildings, and 500 samples for a total estimated cost of $270,291.58.

The Iron Mountain mine where some disseminated chalcopyrite ore has been mined is adjacent to the area to be explored. The similarity in geological conditions of the two properties indicate that ore bodies of the same type are likely to be encountered by the proposed exploration project.

It is recommended that the application be referred to the Field Team for an examination of the property and an appraisal of the proposed exploration program.

A. D. McMahon

A. D. McMahon

Copy to: Division of Minerals
Branch of Base Metals (2)
Thor Kiilsgaard, U.S.G.S.
F. D. Lamb
F i l e s

IN REPLY REFER TO:

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

OFFICIAL FILE COPY
DMEA
RECEIVED 1957

DATE		CODE
7/22	C	220
7/22	WRG	500

July 19, 1957
Re: DMEA 4786
Shasta-Phelps Dodge Joint Venture
Sugar Loaf Mtn. Area
Shasta County, Calif.
$270,291.58 - Copper

Memorandum

To: W. R. Griswold, Defense Minerals Exploration Administration

From: N. E. Nelson, U. S. Geological Survey

Subject: Review of application

The applicant requests assistance in exploring, by diamond drilling, rhyolite beds of the Balaklala (Devonian) formation for masses of copper and zinc-bearing heavy sulfide, similar to those mined at the several mines in the West-Shasta Copper-Zinc District.

Probably all of the important orebodies occur in the so-called middle Balaklala rhyolite beds and looking for ore in other rocks is likely to prove fruitless. The geologic map which is part of Professional Paper 285, Geology and Base-Metal Deposits, West Shasta Copper Zinc District, 1956, shows the immediate project area to be underlain by Balaklala rhyolite but as depicted, the middle member, Dbm, has largely been eroded and what remains, forms a capping of knobs and a thin veneer on the lower rhyolite on the slope of Sugar Loaf Mountain. The dips of the foliation as shown are into the mountain which means the foliation crosscuts the inferred bedding rather than parallels it as assumed in the cross sections A - D of the application.

Adits C and E seem to furnish good sections of one-half the belt it is proposed to drill. If they have been opened, they might well obviate the drilling of the proposed holes on the south side of the center line in the B, C, and D fenses, and give a clue as to the validity of the geologic assumption expressed in the cross sections. If the adits, E in particular, have not been opened, it should be worthwhile to do so unless it is reasonably certain extensive timbering might be required.

Referral of the application to the Field Team is recommended.

N. E. Nelson

N. E. Nelson

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

July 15, 1957

Shasta-Phelps Dodge Joint
Venture
P. O. Box 857
Redding, California

Subject: DMEA 4786

Gentlemen:

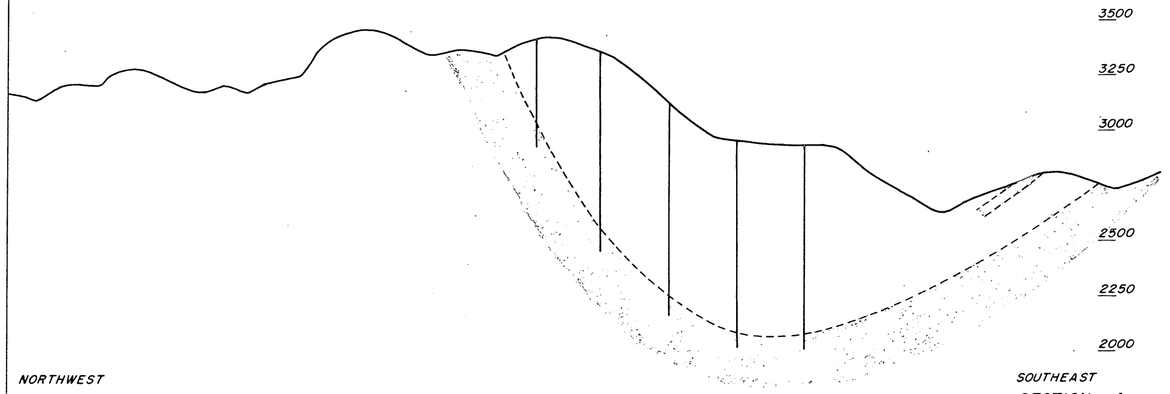
Your application for exploration assistance, dated 6/29/57 submitted to our office at Reno, Nevada has been assigned Docket Number 4786 and referred to the Division of Base Metals in the Washington office. Kindly identify all future correspondence relating to your application by this Docket Number.

Sincerely yours,

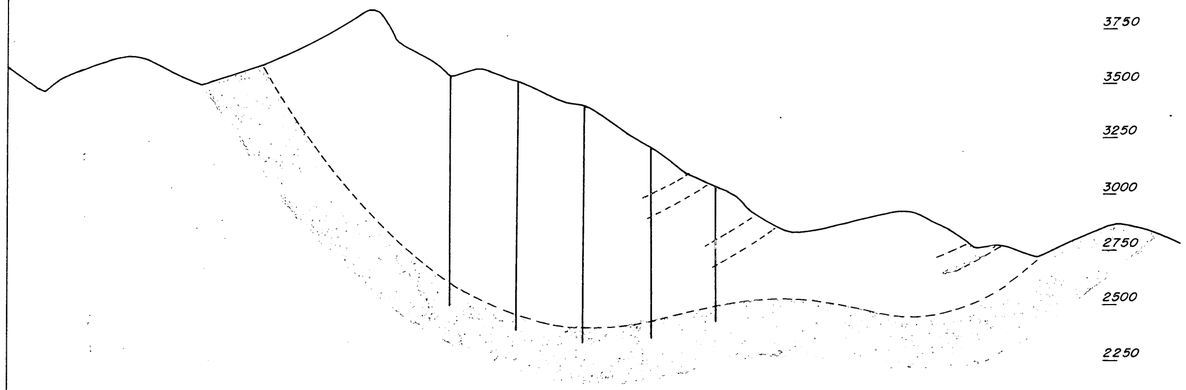
Allen S. Dakan, Director
Operations Control and
Statistics Division

Copy to:

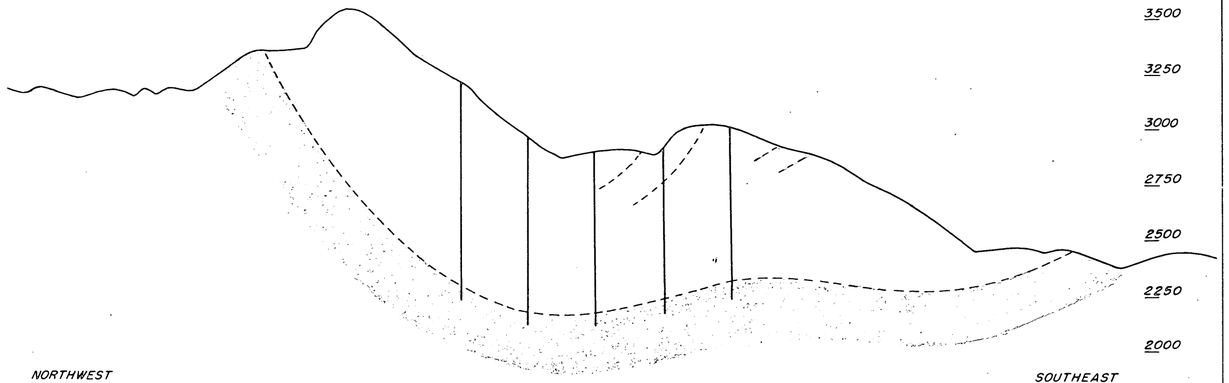
Region II



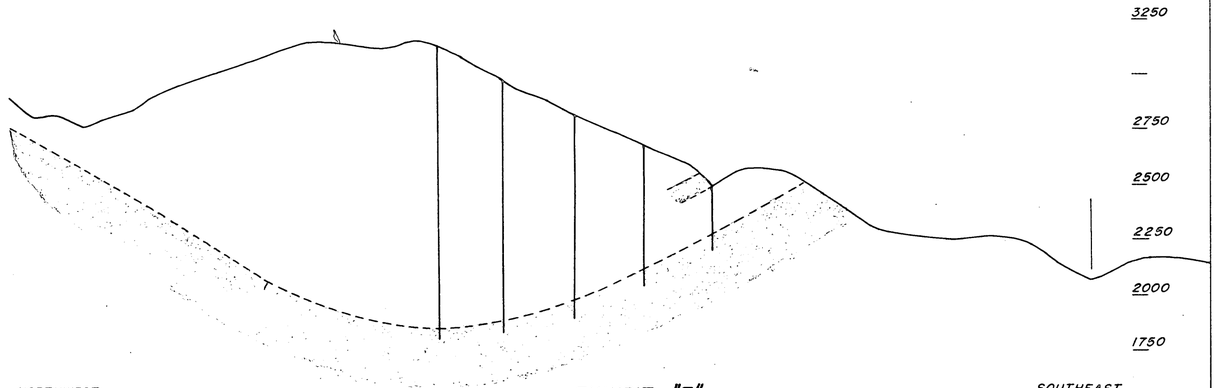
SECTION A.
ROW "A"



SECTION B.
ROW "B"



SECTION C.
ROW "C"



SECTION D.
ROW "D"

EXHIBIT "E"

DMEA LOAN APPLICATION

SUGAR LOAF AREA

SHASTA-PHELPS DODGE JOINT VENTURE

WEST SHASTA COPPER-ZINC DISTRICT

SHASTA COUNTY, CALIFORNIA

GEOLOGICAL SECTIONS THROUGH PROPOSED DIAMOND DRILL HOLES

SCALE 1" = 500'

0 100 500 1000

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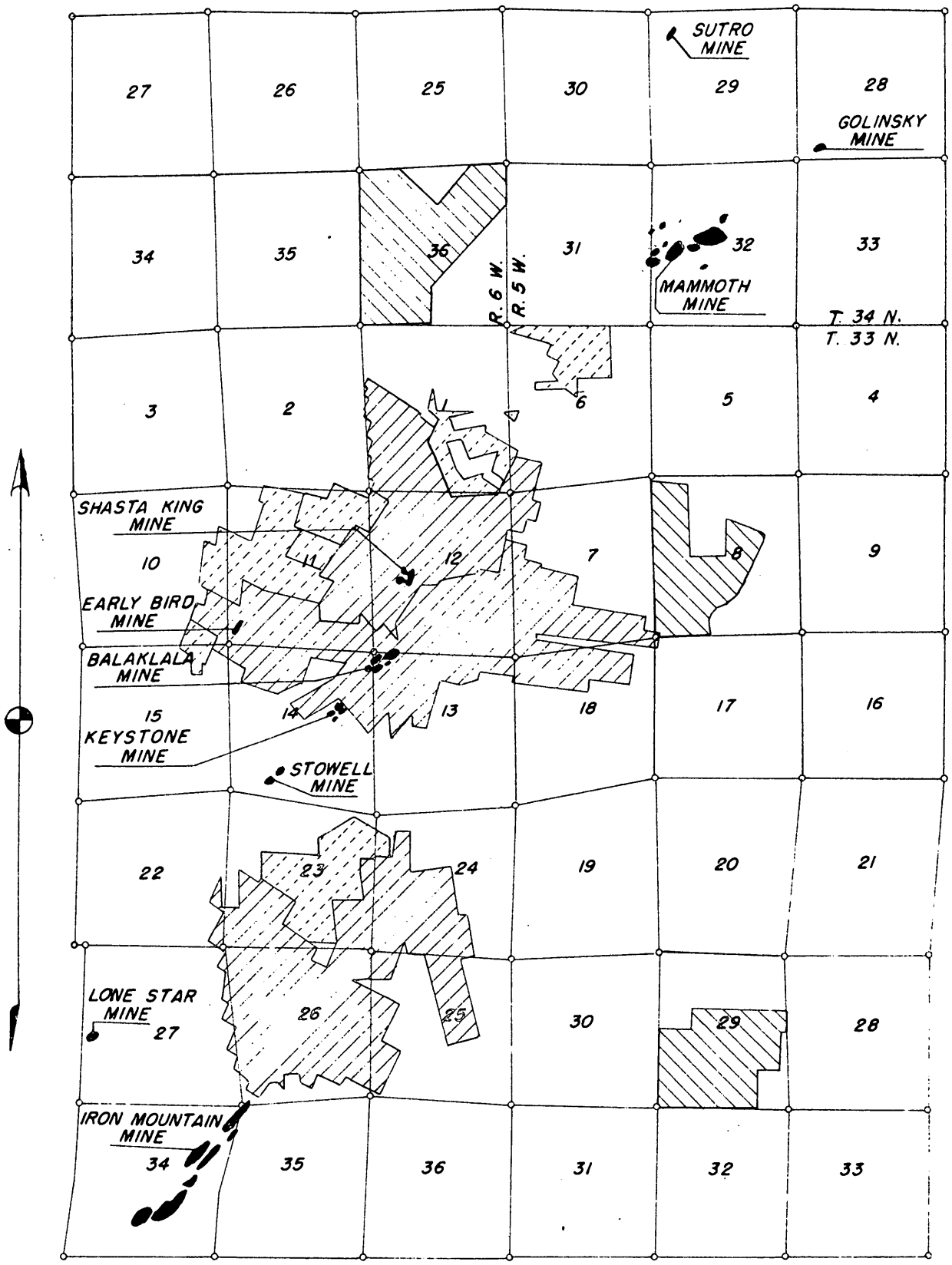
D M E A
RECEIVED JUL 15 1957

DATE	INITIALS	CODE



SUGAR LOAF AREA

EXHIBIT "B"

EXPLANATION

FEE LAND

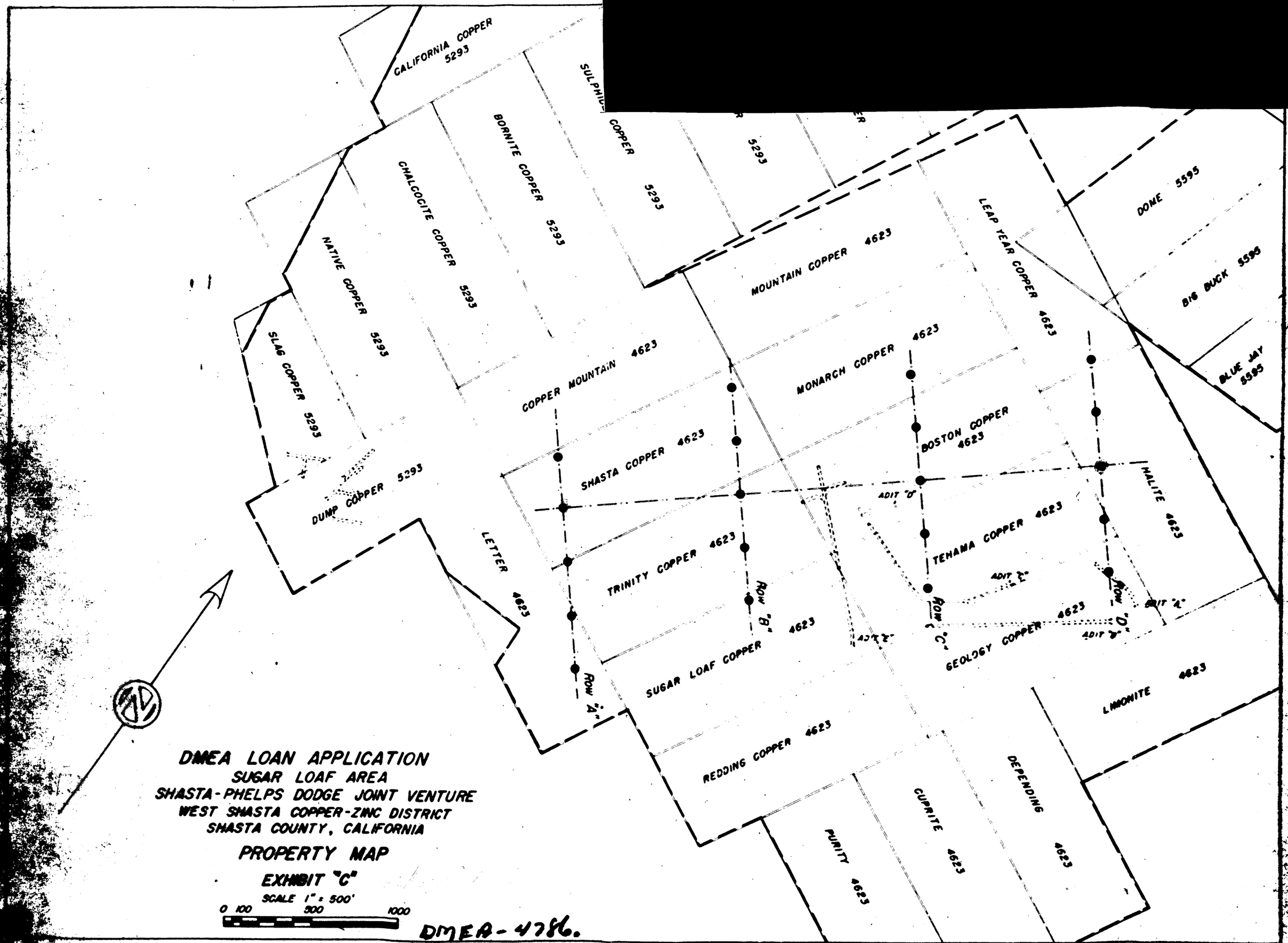
PATENTED MINING CLAIMS

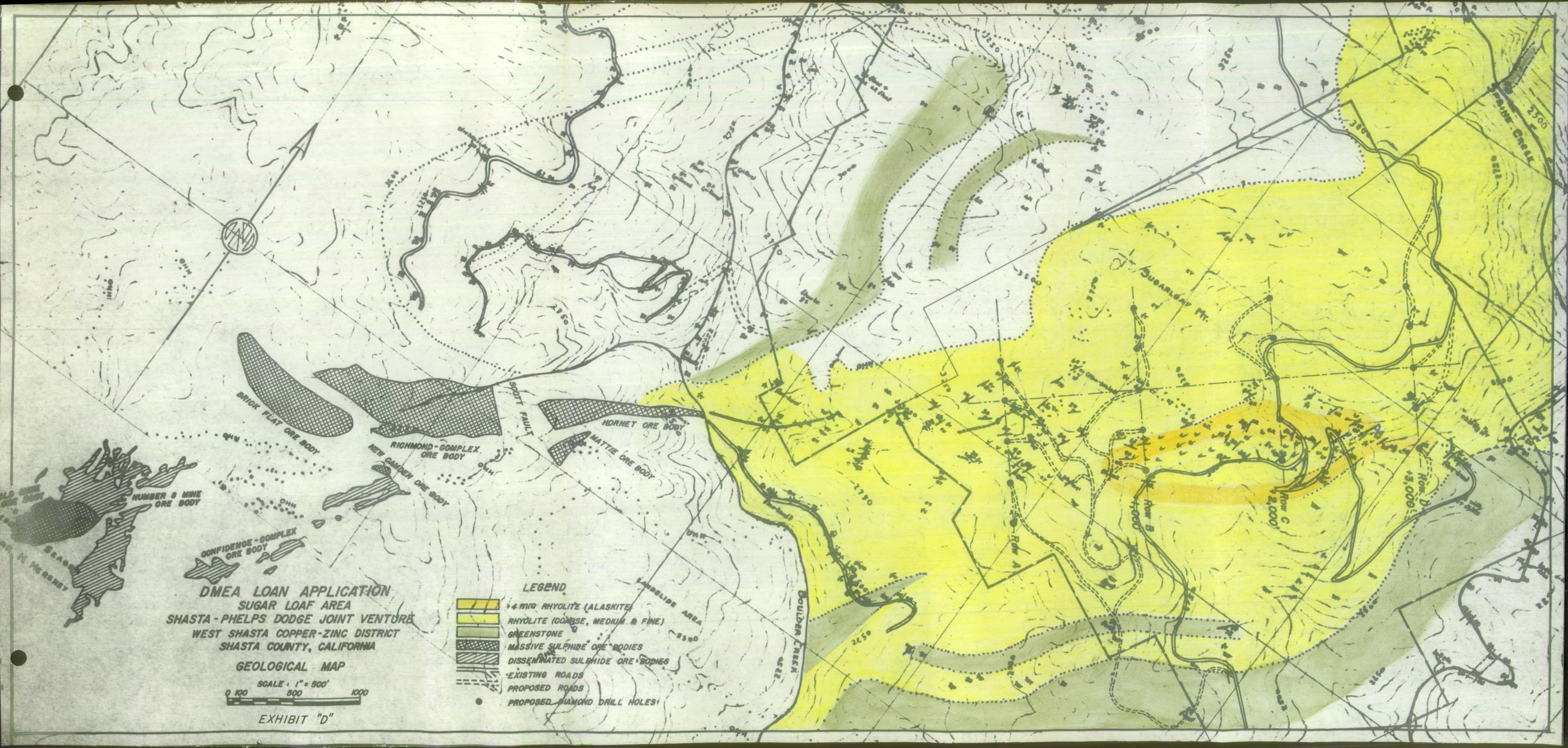
UNPATENTED MINING CLAIMS

MASSIVE SULPHIDE MINES

SCALE

1 0 1 MILES


CALIFORNIA COPPER 5293
SULPHUR COPPER 5293
BORNITE COPPER 5293
CHALCOCITE COPPER 5293
NATIVE COPPER 5293
SLAG COPPER 5293
DUMP COPPER 5293
COPPER MOUNTAIN 4623
MOUNTAIN COPPER 4623
MONARCH COPPER 4623
LEAP YEAR COPPER 4623
DONE 5595
BIG BUCK 5595
BLUE JAY 5595
SHASTA COPPER 4623
BOSTON COPPER 4623
HALITE 4623
LETTER 4623
TRINITY COPPER 4623
TEHAMA COPPER 4623
ADIT "D"
ADIT "E"
ADIT "A"
ADIT "B"
ADIT "C"
ROW "A"
ROW "B"
ROW "C"
ROW "D"
SUGAR LOAF COPPER 4623
GEOLOGY COPPER 4623
LIMONITE 4623
REDDING COPPER 4623
PURITY 4623
CUPRITE 4623
DEPENDING 4623
DMEA LOAN APPLICATION
SUGAR LOAF AREA
SHASTA-PHELPS DODGE JOINT VENTURE
WEST SHASTA COPPER-ZINC DISTRICT
SHASTA COUNTY, CALIFORNIA
PROPERTY MAP
EXHIBIT "C"
SCALE 1" = 500'
0 100 500 1000
DMEA-4786.


DMEA LOAN APPLICATION
SUGAR LOAF AREA
SHASTA-PHELPS DODGE JOINT VENTURE
WEST SHASTA COPPER-ZINC DISTRICT
SHASTA COUNTY, CALIFORNIA
GEOLOGICAL MAP
SCALE: 1" = 500'
0 100 500 1000
EXHIBIT "D"
LEGEND
4 MILE RHYOLITE (ALASKITE)
RHYOLITE (COARSE, MEDIUM & FINE)
GREENSTONE
MASSIVE SULPHIDE ORE BODIES
DISSEMINATED SULPHIDE ORE BODIES
EXISTING ROADS
PROPOSED ROADS
PROPOSED DIAMOND DRILL HOLES
BRICK FLAT ORE BODY
RICHMOND-COMPLEX ORE BODY
NEW CANDY ORE BODY
SCOTT FAULT
HORNET ORE BODY
MATTIE ORE BODY
NUMBER 8 MINE ORE BODY
CONFIDENCE-COMPLEX ORE BODY
SEAGRAVE
DR. W. McGRAHEY
LANDSLIDE AREA
BOULDER CREEK
SUGARLOAF MT.
SPRING CREEK
ROW A
ROW B
ROW C
ROW D
2750
2250
2500
3500
3250
3000
2300

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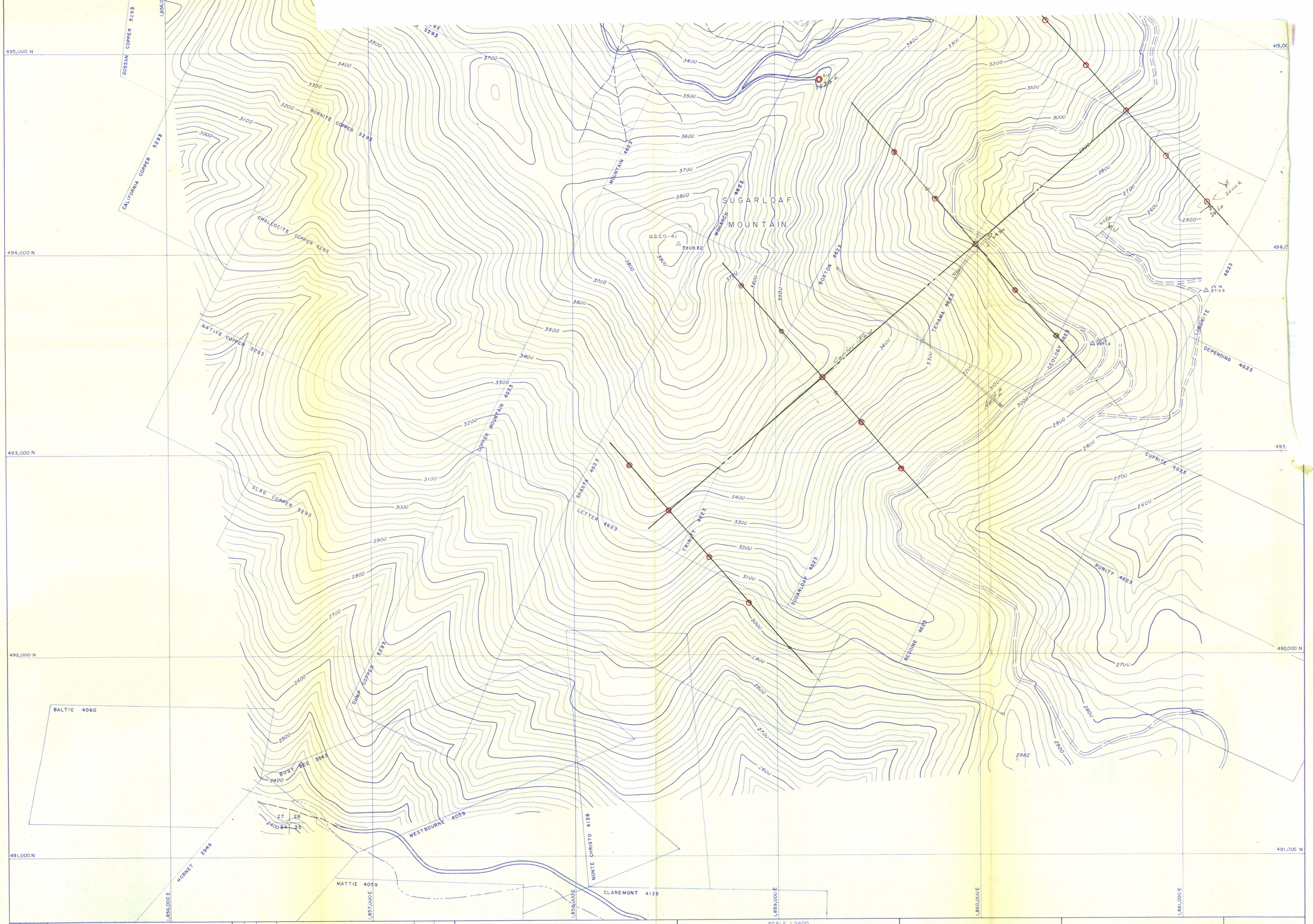
D M E A
RECEIVED JUL 15 1957

DATE	INITIALS	CODE



REFERENCE		REVISIONS			
		1/15/58	ROADS AND PROPERTY LINES	RBP	

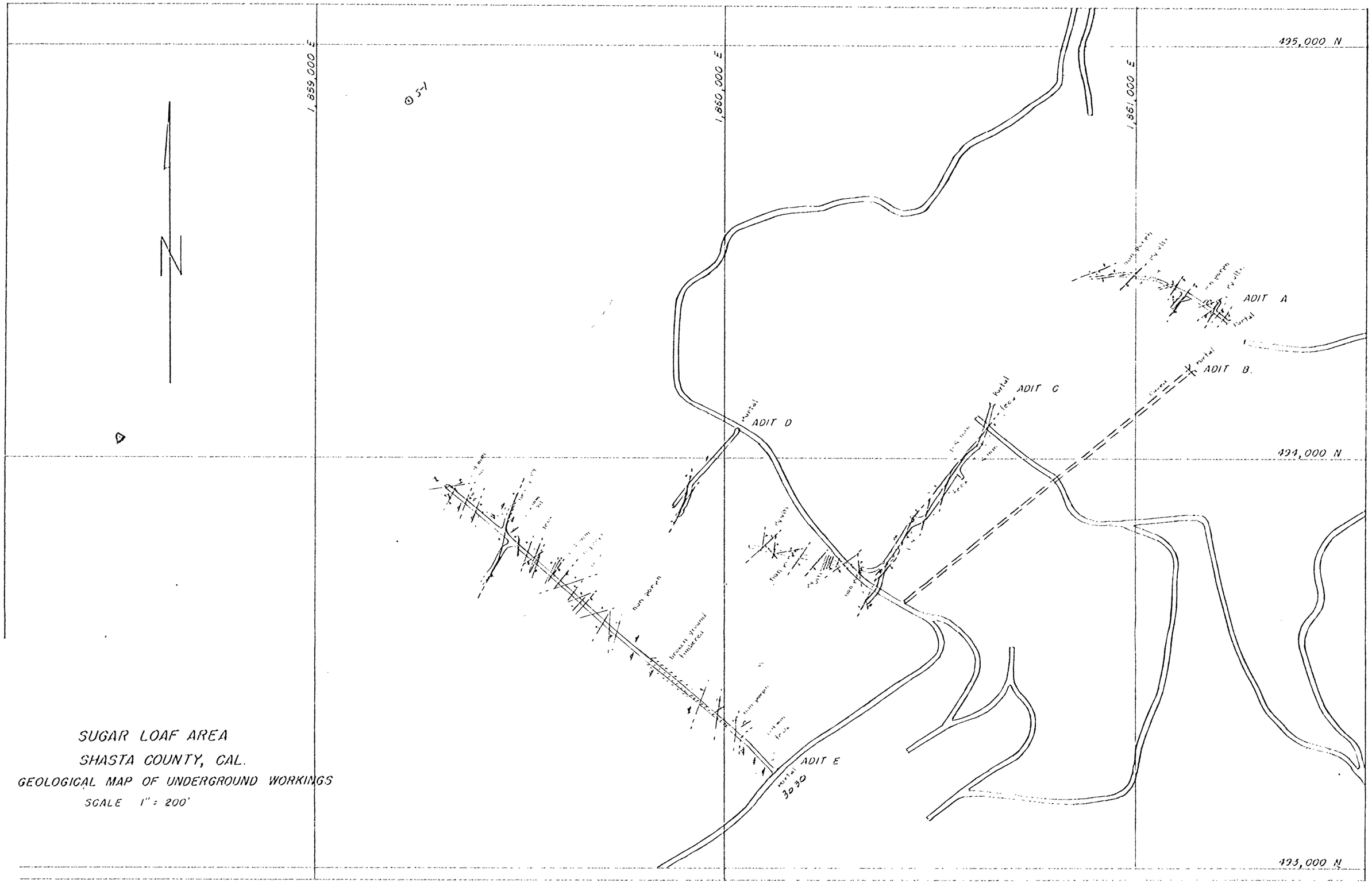
Compiled by FAIRCHILD AERIAL SURVEYS, INC. Los Angeles — New York
BY STEREOPHOTOGRAMMETRIC METHODS
PHOTOGRAPHY DATED JULY 1957
CONTROL BY USC & GS, U.S.C.O., & FAS PROJECT C-22894

SCALE 1:2400
0 200 400 600 800 FEET
CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL
1000 FOOT GRID IS BASED ON THE PLANE COORDINATE SYSTEM FOR THE STATE OF CALIFORNIA (ZONE 1)

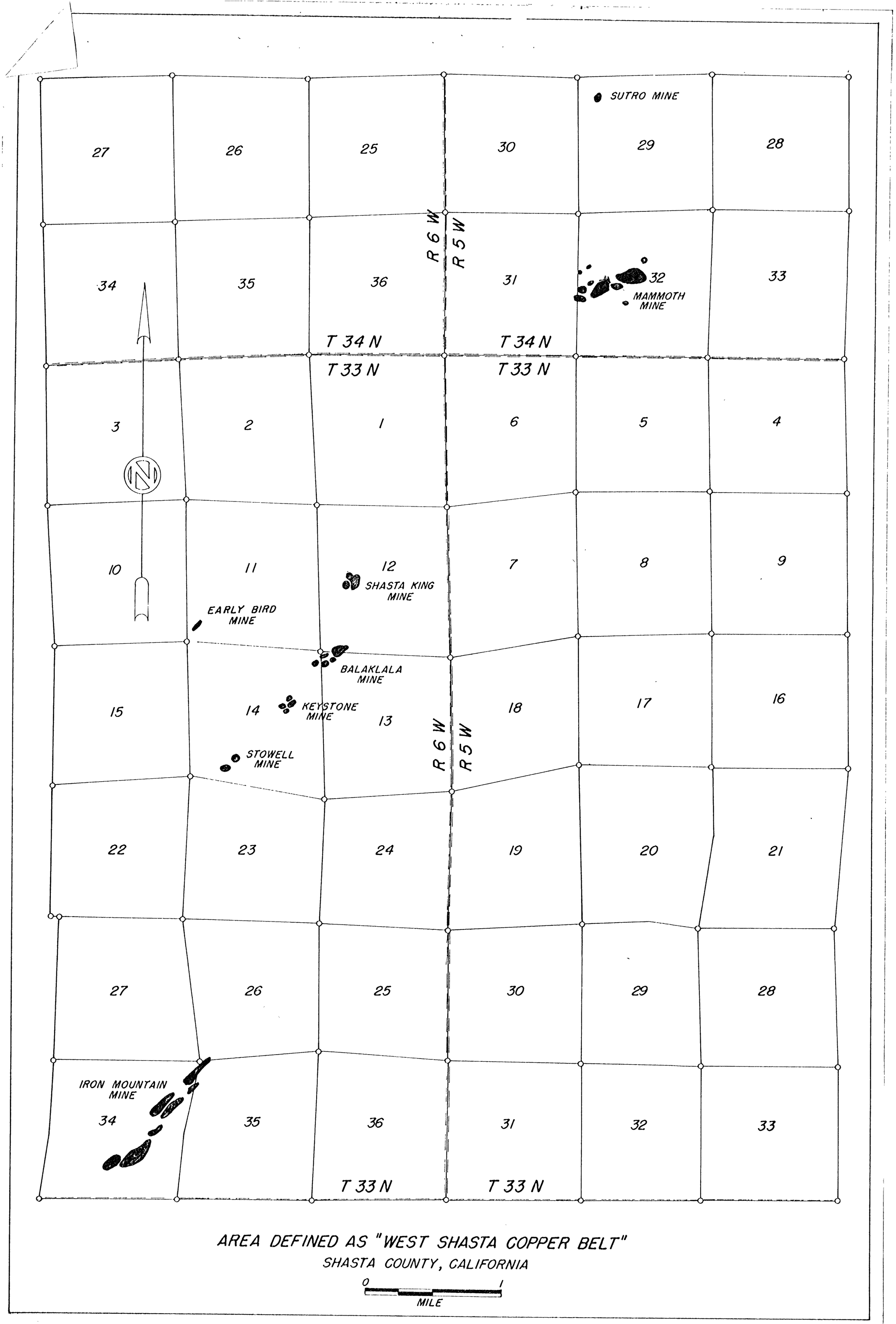
SHASTA-PHELPS DODGE JOINT VENTURE

SUGARLOAF MOUNTAIN SURFACE TOPOGRAPHY

DRAWING NO. 201.44.22.1



SUGAR LOAF AREA
SHASTA COUNTY, CAL.
GEOLOGICAL MAP OF UNDERGROUND WORKINGS
SCALE 1" = 200'



AREA DEFINED AS "WEST SHASTA COPPER BELT"
SHASTA COUNTY, CALIFORNIA