100

MAR 23 1954

Mr. Bruno Altschiern
139 North Sutcliff Avenue
Los Angeles 49, California

Re: Project No. DMEA 3Ck - Tungsten
The Starlight Mine
San Bernardino County, California

Dear Mr. Altschiern:

Your application for aid for an exploration project and other data available to us in Washington concerning the above-referenced property have been reviewed.

Exploration projects approved by the Defense Minerals Exploration Administration must, in the judgment, show definite promise of yielding materials of acceptable grade in quantities that will significantly improve the mineral supply position for the National Defense Program. However, such projects must not go beyond a reasonable delineation and sampling of the ore and must not include development of work promoted primarily for mining or preparation for mining.

Careful study of all our information, although noting the occurrence of tungsten mineralization at the "Old Lim" and "No. 1" areas, indicates to us that the probability of disclosing minable ore reserves at these locations by your proposed program is not sufficiently promising to justify Government participation.

The proposed work at the "No. 1" deposit is considered to be primarily development and, therefore, not allowable under the DMEA program. It also appears that exploration at depth in this area is not justified because the ore apparently is pinching out.

Under the circumstances, we regret to advise that your application is denied. We wish to thank you for your interest in the Defense Minerals Program and for bringing your property to our attention. We are also returning the original of your title guarantee (No. 275,709) by the Pioneer Title Insurance and Trust Company, San Bernardino, California, dated June 17, 1953.

Sincerely yours,

O. D. Mitchell

Administrator

Enclosure

cc: ROMEN
FIELD TEAM, REG. III
OGE
OFEL. CONS.

OCT ADM. REND. FILE
R. W. GERRAN, USBM
W. P. MAYNE, USGS

Mitchell/Mulchrone/Lafont 3/22/54

MAR 23 1954

Mr. Bruce Aitchinson
139 North Soledad Avenue
Los Angeles 49, California

Re: Contract No. DMEA 3008 - Tungsten
The Starlight Mine
San Bernardino County, California

Dear Mr. Aitchinson:

Your application for aid for an exploration project and other data available to us in Washington concerning the above-referenced property have been reviewed.

Exploration projects approved by the Defense Minerals Exploration Administration must, in its judgment, show definite promise of yielding materials of acceptable grade in quantities that will significantly improve the mineral supply position for the National Defense Program. However, such projects must not go beyond a reasonable delineation and sampling of the ore and must not include development of work premeditated primarily for mining or preparation for mining.

Careful study of all our information, although noting the occurrence of tungsten mineralization at the "Old Lib" and "No. 3" areas, indicates to us that the probability of disclosing minable ore reserves at these locations by your proposed program is not sufficiently promising to justify Government participation.

The proposed work at the "No. 3" deposit is considered to be primarily development and, therefore, not allowable under the DMEA program. It also appears that exploration at depth in this area is not justified because the ore apparently is pinching out.

Under the circumstances, we regret to advise that your application is denied. We wish to thank you for your interest in the Defense Minerals Program and for bringing your property to our attention. We are also returning the original of your title guarantee (No. FTS-709) by the Pioneer Title Insurance and Trust Company, San Bernardino, California, dated June 17, 1953.

Sincerely yours,

C. O. Mittendorf

Administrator

Enclosure

cc: AEC, BEAD, FTIR
H. V. GUTHRIE, DMEA
T. P. BAKER, DMEA

FMitchinson/Fulchinson/Lafner 3/22/54

DOCKET
FIELD TLAB, FEG. XII
GEN MGR
OPER. COMP.

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

Mr. Bruce Aitchison
139 North Saltair Avenue
Los Angeles 49, California

Re: Docket No. DMEA 3204 - Tungsten
The Starbright Mine
San Bernardino County, California

Dear Mr. Aitchison:

Your application for aid for an exploration project and other data available to us in Washington concerning the above-referenced property have been reviewed.

~~The~~ Exploration projects approved by the Defense Minerals Exploration Administration must, in its judgment, show definite promise of yielding materials of acceptable grade in quantities that will significantly improve the mineral supply position for the National Defense Program. However, ~~our~~ such projects must not go beyond a reasonable delineation ~~and~~ sampling of the ore and must not include development, or work prosecuted primarily for mining or preparation for mining.

Careful study of all our information, although noting the occurrence of tungsten mineralization at the "Old Liz" and "No. 10" areas, indicates to us that the probability of disclosing minable ore reserves at these locations by your proposed program is not sufficiently promising to justify Government participation.

The proposed work at the "No. 1" deposit, ~~however,~~ is considered to be primarily development and, therefore, not allowable under the DMEA program. Under these circumstances, we regret to advise ~~you~~ that your application is denied.

~~We wish to thank you for your interest in the Defense Minerals Program and for bringing your property to our attention. We are also returning the original of your title guarantee (No. 275,709) by the Pioneer Title Insurance and Trust Company, San Bernardino, California, dated June 17, 1953.~~

Sincerely yours,

Administrator

Enclosure

March 18, 1954

MEMORANDUM

To: Administrator, DMEA

From: Iron and Ferro-Alloys Division, DMEA

Subject: Denial of exploration project in the amount of $60,939.00, Docket No. DMEA 3204 - Tungsten
Bruce Aitchison
The Starbright mine
San Bernardino County, California

The denial of the subject application by this Division is based on the following information:

(1) The applicant proposed to explore for tungsten at three locations at the Starbright mine: (a) Old Liz area, (b) No. 1 area (source of major proportion of past production), and (c) No. 10 area. The exploration proposed by the applicant was as follows:

Old Liz area - Drift upon the outcropping ore from a point about 100 feet north of the old crosscut for a distance of approximately 300 feet. This work was to be followed by diamond drilling from the drift and surface if warranted.

No. 1 area - Sink the inclined shaft 30 feet below present bottom and drift east 200 feet (or more if the tactite persists). Followed by short diamond drill holes. Other drill holes were planned to explore the ore body in the other directions.

No. 10 area - Sink on ore from bottom of present open pit approximately 100 feet. Drift north and south upon the footwall of the tactite body. Diamond drill short holes from the underground workings to further delineate the ore body. Surface drilling was to be included if warranted.

(2) The deposit was examined separately by representatives of the Geological Survey and the Bureau of Mines. Neither agency recommended the proposed program at the Old Liz area. Here the scheelite is sparingly disseminated in

the tactite, generally as crystals 2-5 mm long, spaced at about 1-foot intervals. The only significant concentration of scheelite is in the tactite above the crosscut adit where a zone about 10 feet long and 2 feet thick is indicated by lamping to constitute low or medium grade ore.

(3) The Geological Survey members of the Field Team recommended exploration at the No. 1 and No. 10 areas.

(4) The examination of the property by the Bureau of Mines was made approximately two months later than that by the Geological Survey. Exploration work completed by the applicant since the examination by the Geological Survey indicated that the area No. 10 scheelite-bearing tactite practically pinched out at a depth of 27 feet.

(5) The Bureau of Mines' member of the Field Team noted that a 20-foot drift, extended westerly from the west incline stope of Area No. 1, was in barren granite at the face. It was also stated: "The No. 1 area would make an attractive lease operation. The proposed exploration work would practically amount to a development operation, but would have some exploration value as mentioned by the examining geologists."

(6) According to the letter covering the Field Team reports, the geologists concur that, in view of the unsuccessful company-financed exploration in the No. 10 area, no Government assistance for further exploring that area should be forthcoming. However, exploration was recommended for the No. 1 area.

(7) The No. 1 deposit has pinched down to 2 feet in the two southernmost exposures at depth and the 20-foot drift west from the west stope ends in granite. These two cutoffs, the localization of the tactite in roof pendants, and the more shallow depth indicated by the neighboring deposits would all denote that the limits of this deposit have nearly been reached. Further exploration is not warranted.

(8) The Geological Survey Commodity Division recommends denial.

(9) The Commodity Division of the Bureau of Mines concurs in the denial.

cc: DOCKET
CODE 400
OPER. COMM.
ADM. READ. FILE
FARutledge/ls 3/18/54

W. S. Martin, Chief
Iron and Ferro-Alloys Division

IN REPLY REFER TO: 400

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

March 15, 1954

Memorandum

To: W. S. Martin, DMEA

From: P. W. Guild, U. S. G. S.

Subject: Docket No. DMEA-3204 - Tungsten
Bruce Aitchison
The Starbright Mine
San Bernardino County, California

Work already done at the No. 1 area of the Starbright mine exposes ore on two sides. This ore could be mined and shipped without further exploration, provided that the operation is economically feasible. The exploration proposed by Mr. Sheahan, B.M., and by the geologists seems designed only to prove definitely that this ore exists; in other words, to transfer indicated ore to the measured category. The proposed drift would undoubtedly aid in the extraction, but not lead to the discovery of additional reserves unless it showed that the tactite thickened down dip. I do not see how a certificate of discovery could be made on the basis of this work, for it would not lead to a discovery unless it found conditions to be quite different from those indicated by the existing evidence.

The rather rapid thinning of the ore zone down dip is not encouraging. The proposed exploration would open up the third side of an area of some 1,200 to 1,400 square feet, which may have an average thickness of 3 or 4 feet. A reasonably optimistic appraisal might be 5,000 tons of 0.60 percent ore containing 3,000 units. This could be expected to yield a gross value of $180,000, and the 5 percent royalty should thus repay the loan if all goes well, but the work does not seem designed to find a quantity of new ore significant to the national picture.

I recommend denial of the application.

(3) cc: W.S. Martin

Copy retained 400

400

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

1012 Flood Building
870 Market Street
San Francisco 2, Calif.

February 26, 1954

Memorandum

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

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket No. DMEA-3204 - Tungsten
Bruce Aitchison
The Starbright Mine
San Bernardino County, California

Reference is to your letter dated December 1, 1953, requesting us to make a field examination of the subject property.

The property was visited by Messrs. W. H. MacKevett and C. D. Rinehart, of the Geological Survey, on December 14-18, 1953. Attached are four copies of their report entitled "DMEA-3204, Starbright Mine, San Bernardino County, California, (Tungsten)," dated January 20, 1954.

In view of the geologists' recommendation that some Government participation in exploring the Starbright Mine is justified, and because their report failed to give a reliable, workable estimate of costs, we requested our Mining Division to make a study of the costs of the work proposed by the geologists. In accordance with that request, Mr. Benjamin H. Sheahan, Mining Engineer, visited the property on February 9-11, 1954, to determine estimated unit costs for shafts, drifts, and trenches. Four copies of Mr. Sheahan's supplemental report entitled "DMEA-3204, Starbright Mine, San Bernardino County, California, (Tungsten)," dated February 18, 1954, are attached.

The geologists recommended that work be done in Areas No. 1 and No. 10. It should be noted, however, that when Mr. Sheahan visited the property, he noted that work done in the No. 10 Area since the geologists examined the property, showed that the mineralized section of the tactite pendent in that area had pinched out and that further work in that Area is not warranted.

Reviewed by
DMEA OPERATING COMMITTEE
3-5-54
(date)

The geologists concur that in view of the unsuccessful company-financed exploration in the No. 10 Area, as reported by Mr. Sheahan, no Government assistance for further exploring that area should be forthcoming.

Mr. Sheahan and the geologists are in agreement that Government participation in exploring the No. 1 Area at a cost of $6,699 is warranted, and in this Mr. Roscoe Smith and I concur.

H. C. MILLER

H. C. Miller
Executive Officer
DMEA Field Team, Region III

Attachments

Copy to: Roscoe Smith, USGS
A. C. Johnson, Reno

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 2 - 1954

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION III

SUPPLEMENTARY REPORT

DMEA-3204, Starbright Mine

San Bernardino County, California

(Tungsten)

Benjamin H. Sheahan, Mining Engineer
U. S. Bureau of Mines

February 18, 1954

Reviewed by
DMEA OPERATING COMMITTEE
3-5-54
(date)

SUPPLEMENTARY REPORT

Docket No.: DMEA-3204

Name and address of applicant: Mr. Bruce Aitchison
139 North Saltair Avenue
Los Angeles 49, California

Name and location of property: The Starbright group of claims
Located in San Bernardino County,
Calffornia, about 25 miles north of
Barstow, Calif.

SUMMARY

The Starbright mine was examined by an engineer of the Bureau of Mines from Feb. 9 to 11, 1954. The purpose of the examination was to obtain additional cost data and determine estimated unit costs for shafts, drifts, and trenches. The property was previously examined by geologists[1/] of the U.S. Geological Survey in December 1953. Exploration work completed by the applicant since the previous examination indicated that the area No. 10 scheelite bearing tactite practically pinched out at a depth of 27 feet. A 20-foot drift, extended westerly from the west incline stope of the Area No. 1, was in barren granite at the face.

The applicant and his manager both lack mining experience, and consequently unit costs for the work were difficult to estimate. The following unit costs were estimated by the engineer:

Shafts - cost per foot	$66.49
Drifts - " " "	$35.80
Trenches -" " "	$ 2.00

1/ E. M. MacKevett and C. D. Rinehart "Report of Examination by Field Team, Region III, DMEA-3204(Tungsten), Starbright Mine, San Bernardino County, Calif., - Jan. 20, 1954.

The applicants attempt to exploit the deposits resulted in a financial failure, according to Mr. C. W. Alden, manager. Expenditures by the applicant and his associates were reported to amount to about $100,000., while production was less than $9,000. About $20,000 of the total expenditure was made on property payments.

CONCLUSIONS

The No. 1 area would make an attractive lease operation. The proposed exploration work would practically amount to a development operation, but would have some exploration value as mentioned by the examining geologists.

No further work is recommended at the No. 10 deposit, since the tactite has practically pinched out and since an attempt to further exploit this deposit likewise resulted in a failure.

COMPETENCY OF APPLICANT

The applicant, Mr. Bruce Aitchison, and the manager of the property, Mr. C. W. Alden, lack mining experience.

The applicant and the manager optioned the property on July 9, 1953 from Mr. Clair W. Dunton and A. C. Lambert.

To date, this business venture has been unsuccessful, according to Mr. Alden who stated that total expenditures including two property payments have amounted to about $100,000.00. Production by the applicant amounted to less than $9,000.00.

The mine foreman, Mr. Frank R. McCarthy, and one miner were the only employees interviewed who were experienced in mining and exploration work and made this type of work their chief vocation.

EQUIPMENT

Item	Condition
1 Air compressor, 420 cfm., Schramm Buda Diesel	Fair
1 Air compressor, 315 cfm., Ingersoll Rand, diesel	Good
1 Mine hoist, 60-horsepower, gasoline-driven, with 1,000 feet cable and skip	Fair
1 Tugger hoist, air, 1/2-ton capacity	Fair
1 Tugger hoist, air, 1-ton capacity, Gardner Denver	New
1 Generator, 5 KW, LeRoi, 110-220 volt	Fair
1 Generator, 1200 watt, Kohler	Good
4 Rock drills, I.R. A1JBS, with drill steel, and hoses	Good
2 Rock drills, Copco Pacific with air leg, and drill steel	Fair
1 Rock drill, long hole, with 70-foot drill rods	Good
2 Ventilation blowers, 5-inch, with 300 feet vent tube	Fair
1 Bulldozer, Allis-Chalmers, HD14	Fair
1 Truck, dump body, 5-ton, Ford, 1946	Poor
1 Truck, pickup, 3/4-ton, Ford, 1953	Good
5 tons mine rail assorted sizes 12# to 30# per yard	Poor
2 tons pipe, 1-inch to 2-inch sizes	Fair
1,500 pounds explosives, 40% Trojan	Good
3,000 feet fuse	Good
1,600 caps	
2,000 b.f.m. timber 6"x6", 4"x6", 2"x12"	Fair
1 Electric welding set	Fair
1 Acetylene welding set	Fair

Buildings:

1 Tool shack equipped with hand tools, spare parts and blacksmith forge	Fair
25 gallons assorted greases and lubricants	
200 gallons Diesel fuel	New
1 300-gallon water tank with trailer	Good
1 800-gallon galvanized iron water tank	
1 Hoist house	Fair

Item	Condition
1 House trailer	Fair
1 Cabin, watchman's	Fair
1 Shed, 8'x14' at No. 10 Area	Fair
3 Ultra-violet lamps	Fair

The applicant owns other equipment as mentioned in the docket, however, some of the equipment was removed from the property.

ESTIMATED COSTS

Shaft sinking:-

Shaft work recommended by the examining geologists included 20 feet of shaft at No. 1 Area and 100 feet of shaft at the No. 10 Area.

The following costs include rehabilitation and are based upon an estimated rate of advance of 2.5 feet per shift, and one shift per day. Total time required, including 6 days for rehabilitation and clean up: 54 days.

Supervision (including engineering and accounting)		
2 months @ $500.00 per month		$1,000.00
Labor (54 days)		
1 Foreman @ $20.00/day		
1 Miner @ $16.00/day		
1 Mucker @ $14.00/day		
1 Hoistman @ $16.00/day		$3,564.00
Supplies		
Explosives, fuse & caps $2.07/ft.	$ 248.00	
Timber (220 b.f.m. per 5-foot set)	1,320.00	
Air pipe & water pipe @ $0.60/ft.	72.00	
Ventilation tube & mine rail skids	60.00	
Gasoline, lubricants, Diesel fuel oil @ $14.50/da.	783.00	
Water, 300 gal. per day (transportation)	54.00	
		$2,537.00

Operating Equipment:

1. To be purchased: None
2. To be rented: None
3. Owned by applicant and estimated present value:

1 Mine hoist, 60-horsepower with cable and skip	$1,500.00	
1 Air compressor, I.R., 315 c.f.m.	4,000.00	
1 Rock drill complete with air and water hose, drill steel and rock bits	700.00	
1 Ventilation blower, 5-inch	200.00	
1 Generator	400.00	
Misc. hand tools	200.00	
Total estimated value	$7,000.00	
Monthly depreciation 1/60	116.67	
Depreciation @ 2 months		$ 233.34

Initial rehabilitation and clean up - 6 days time (included above)

Miscellaneous:

Sampling and analysis - 24 @ $4.00	96.00
Liability, Ins., payroll, taxes, unemp. ins. @ 12%	548.00

Contingencies:

(None included)

Total cost of 120 feet of shaft work	$7,978.34
Cost per foot	$ 66.49

Drifting:-

Drifting recommended by the examining geologists included 150 feet at the No. 1 Area and 60 feet at the No. 10 Area, or a total of 210 feet.

The following costs are based upon an estimated rate of advance at 4 feet per shift. Time estimated: 52 days.

Supervision:		
2 months @ $500.00/month		$1,000.00
Labor: (52 days)		
1 Foreman @ $20.00/day		
1 Miner @ $16.00/day		
1 Mucker @ $14.00/day		
1 Hoistman @ $16.00/day		
		$3,432.00
Supplies:		
Explosives @ $2.00/foot	$420.00	
Timber	$756.00	
Air & water pipe	$126.00	
Ventilation tube & track	$105.00	
Gasoline, lubricants & Diesel fuel	$754.00	
		$2,161.00
Operating Equipment (depreciation) 2 months @ $116.67/month		233.34
Miscellaneous:		
Sampling and analysis - 40 @ $4.00		160.00
Liability Insurance, Payroll taxes, and unemployment insurance @ 12%		531.84
Total cost of 210 feet of drifting		$7,518.18
Cost per foot		$ 35.80

Trenching:

Ten trenches approximately 10 feet in length were recommended by the examining geologists. The estimated cost is $2.00 per foot. Trench size average 3 feet by 4 feet by 10 feet.

Total cost of trenches	$ 200.00

DISCUSSION

Unit costs at the property would depend to a great extent upon the efficiency of the crew employed. Because of the lack of mining and ex-

ploration experience on the part of the applicant, the best way to do the work would be by an independent contract, and it would be possible to receive bids for the work.

Time required to complete the work would amount to 4 months providing the work was done efficiently.

The estimated costs include light timber for both the shaft and drift work (see fig. 4). A summary of the costs at each area follow:

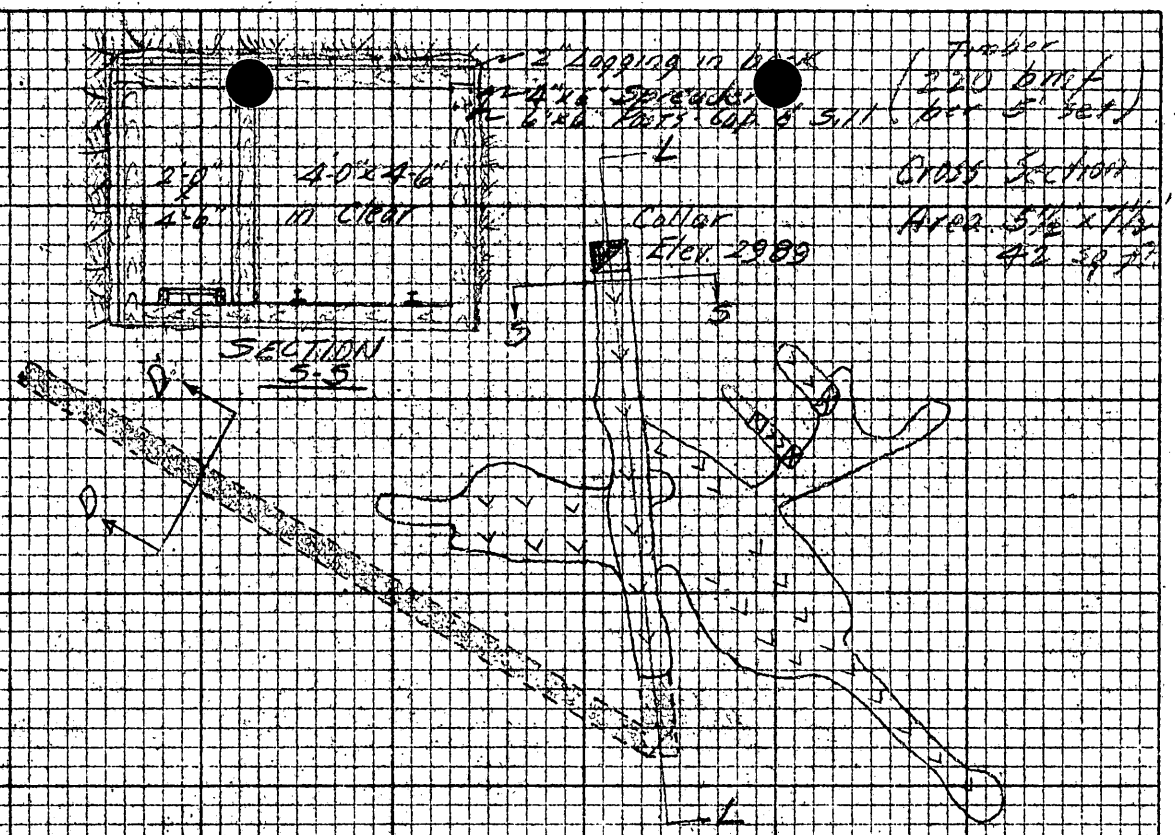
No. 1 Area:

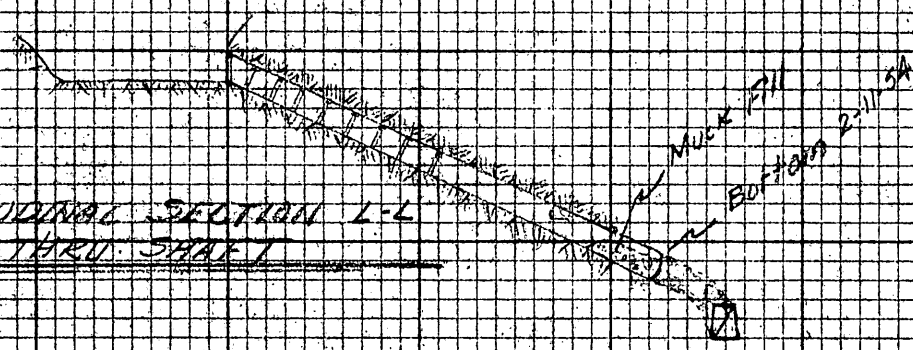
	Unit cost/foot	Total
20 feet shaft, 5-1/2 x 7-1/2 feet - outside of timber	$66.49	$1,329.80
150 " drift, 4-1/2 x 6-1/2 feet in clear	$35.80	5,370.00
		$6,699.80

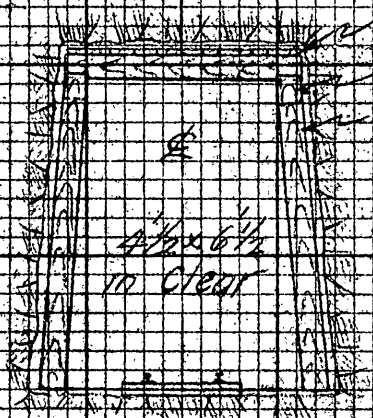
No. 10 Area:

100 foot shaft	$66.49	$6,649.00
60 " drift	$35.80	2,148.00
10 trenches 3' x 4' x 10' approx.	2.00	200.00
		$8,997.00

Total cost No. 1 and No. 10 Areas $15,696.80







No. 1 Area
STARBRIGHT MINE
DIXIE 9204 - Tungsten
San Bernardino Co., Calif.

Figure 4

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
MAR 2 - 1954

UNITED STATES
DEPARTMENT OF THE INTERIOR
SECRETARY OF THE INTERIOR, D. McKAY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION III

DMEA-3204, Starbright mine

San Bernardino County, California

(Tungsten)

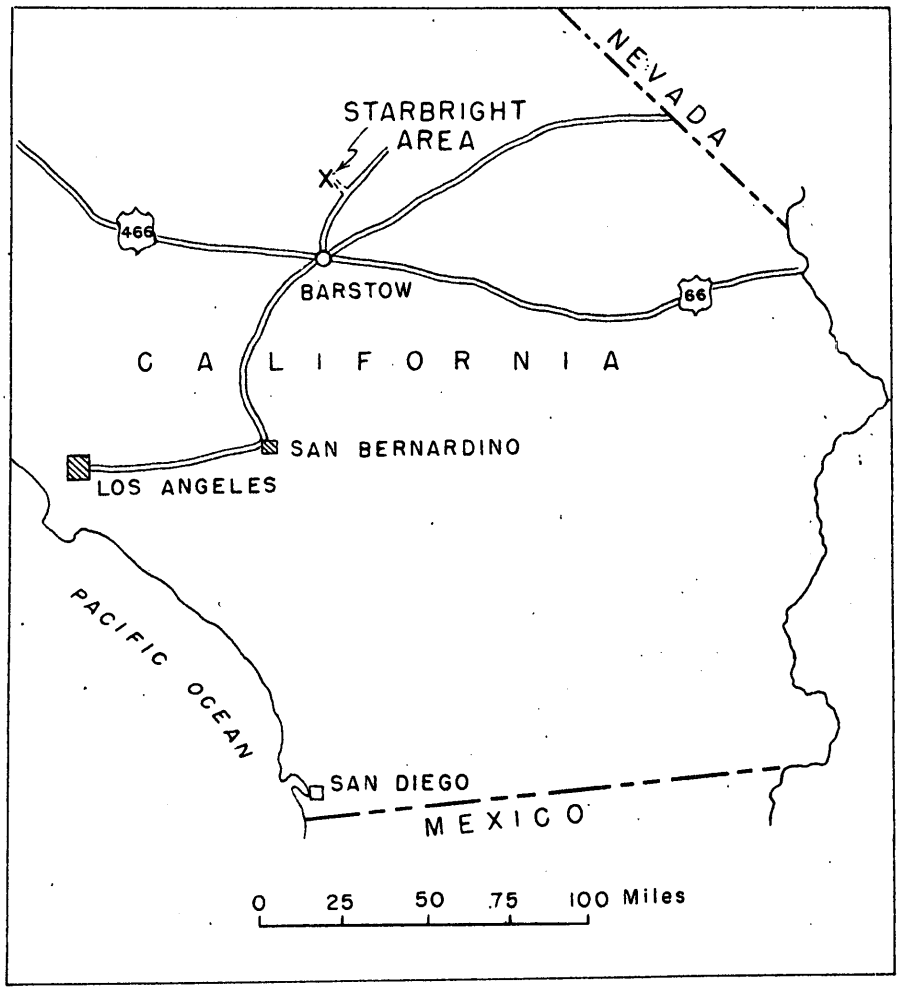
E. M. MacKevett, Geologist
C. D. Rinehart, Geologist

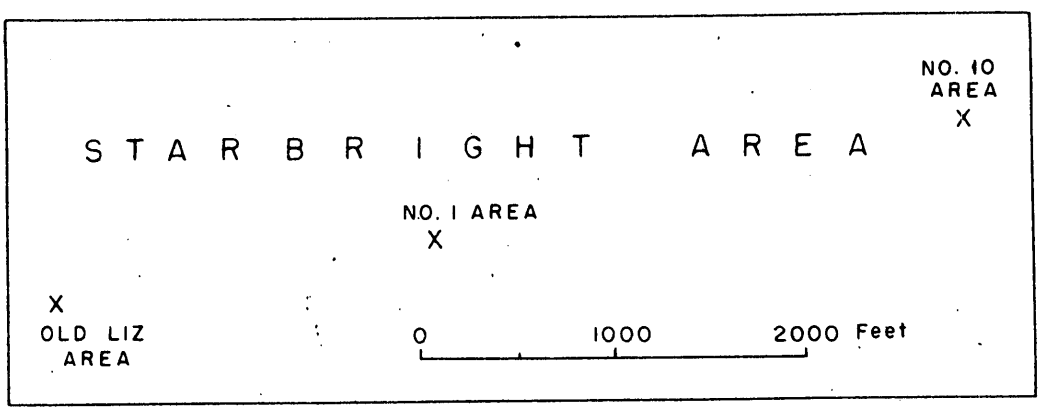
U. S. Geological Survey

January 20, 1954

Reviewed by
DMEA OPERATING COMMITTEE

_____
(date)





INDEX MAP SHOWING LOCATION OF STARBRIGHT TUNGSTEN AREA AND PRINCIPAL WORKINGS

Figure 1

DMEA-3204, Starbright mine

San Bernardino County, California

(Tungsten)

SUMMARY

The examining geologists believe that government participation in exploring the Starbright mine is justifiable and recommend a total expenditure of about $10,250 for exploring the No. 1 and No. 10 areas. Exploration in the Old Liz area does not appear worthy of government participation.

An estimated 7600 tons of indicated ore containing 0.60 percent WO_3 is in the No. 1 area. Proposed exploration at the No. 1 area would cost $4,550 and consist of deepening the inclined shaft 20 feet and drifting northwest 150 feet from near the bottom of the shaft.

The No. 10 area contains at least 900 tons of inferred ore averaging about 0.60 percent WO_3 plus a sizeable additional tonnage of similar grade inferred ore. Adequate exploration of this area would cost $5,700 and consist of sinking a 100-foot inclined shaft, drifting a total of 60 feet from the bottom of the shaft, and 100 feet of surface trenching.

INTRODUCTION

U. S. Geological Survey geologists E. M. MacKevett and C. D. Rinehart examined the Starbright area from December 14th to December 18th, 1953, during which time they were intermittently accompanied

by C. W. Alden, a representative of the applicant and one of the mine's financial backers, and Frank McCarthy, the mine superintendent. The examination was made at the request of DMEA officials in an endeavour to obtain more geological data to accompany DMEA docket 3204. Surface maps at scales of 1 inch equals 40 feet and 1 inch equals 50 feet were made of the No. 1, No. 10, and Old Liz workings by plane table and alidade methods. The No. 1 underground workings were mapped at a scale of 1 inch equals 40 feet. All of the workings and pertinent surface areas were lamped with an ultraviolet lamp and 18 samples for assays were taken from the No. 1 and No. 10 workings.

The Starbright group of claims is in San Bernardino County, California, about 25 miles north of Barstow (Fig. 1). The three areas on the property pertinent to the DMEA application are the Starbright No. 1 and Old Liz in sec. 19, T. 12 N., R. 1 E., SBBM, and the Starbright No. 10 area in sec. 20, T. 12 N., R. 1 E., SBBM. The property is readily accessible by travelling northeasterly from Barstow on the paved Camp Irwin road for about 20 miles and then northwesterly on a dirt road for about 5 miles. The mine lies within the Mojave Desert at altitudes near 3,000 feet and, according to the application, has produced approximately $900,000 worth of tungsten ore from the No. 1 workings since its discovery in 1950.

GEOLOGY

General statement

Granitic rocks and metamorphosed sedimentary rocks are the dominant rock types in the Starbright area. The metamorphic rocks appear to be

mainly in roof pendants and include crystalline and silicated limestone, tactite, impure quartzite, gneiss, and schist. Faults are abundant in the Starbright area, but all seem to have small displacement.

ORE DEPOSITS

The Starbright tungsten deposits are contact-metamorphic and occur in tactite bodies which generally strike east and dip 30°-60° south. Three distinct deposits are in the area, and these have been explored by the No. 1, No. 10, and Old Lis workings. Scheelite, the only tungsten-bearing mineral, occurs as disseminations in the tactite, and less commonly as fracture coatings; it ranges in size from specks to about 5 mm in maximum dimension. The richest-appearing ore consists of clouds of minute scheelite crystals in a friable, altered matrix. Garnet is the prevailing mineral in the tactite, and epidote, quartz, and iron oxides are lesser constituents.

NO. 1 AREA

General geologic setting

Medium- to coarse-grained granodiorite, the predominant rock underlying the area, encloses a body of garnet-quartz-epidote tactite, which in plan is about 230 feet long and 80 feet wide. A steeply dipping to vertical amygdaloidal basalt dike 5 feet thick cuts both the granodiorite and the tactite in the center of the map area (Pl. 1). Biotite schist exposed along the north and northwest sides of the map area is similar to quartz diorite in composition, and is separated from the tactite by granodiorite with which it exhibits a gradational

contact. The composition and contact relations of the schist suggest that it is probably unrelated to the tactite in origin.

Mine workings

Most of the ore mined has come from an open pit 300 feet long, 40 feet wide at the east end, and 90 feet wide at the widest part near the west end. The pit ranges in depth from 10 feet near the east end to 30 feet at the west. The tactite body has been explored underground by means of 350 feet of workings accessible through an inclined shaft driven in the south wall at the base of the pit.

Sampling

A total of 8 chip samples were taken in the No. 1 area, 3 from the pit and 5 from the underground workings. Sample localities are plotted on Plate 1. The samples were assayed by the Hydrometallurgical and Ore-Dressing Branch of the U. S. Bureau of Mines at Reno, Nevada. The assays and sample widths are tabulated below.

Sample No.	Width in feet	Percent WO_3
1-P	6	0.29
2-P	2	0.82
3-P	6	0.73
1-S	2.5	0.67
2-S	2	0.89
3-S	3	0.52
4-S	2	*0.01
5-S	3	0.60

* less than

Geology

Structure

The tactite body is tabular, strikes slightly north of west, dips 20° to 25° south, steepening near the bottom of the inclined shaft,

and ranges in thickness from 2 to 15 feet. Although the rocks are cut by many faults few show displacement. The granodiorite-tactite hanging-wall contact, at the west end of the pit, shows an apparent minimum vertical displacement of 28 feet along a vertical east-striking fault. The hanging-wall contact also shows vertical displacement of about 5 feet along the basalt dike which is bounded on both sides by faults. No offset was seen along other faults.

Tactite and scheelite distribution

In general the tactite is medium grained and composed of garnet, quartz, and epidote, in order of relative abundance, with local concentrations of scheelite. At several places in the pit the tactite has been altered to soft yellowish-brown friable material which is locally of mineable grade. Many scattered, unsheared, euhedral crystals of garnet and scheelite within this material suggest that hydrothermal alteration rather than shearing caused the break-down of the tactite.

The tactite along the north side of the pit is apparently a thin skin overlying the rather irregular granodiorite footwall contact. Hence, the sporadic scheelite distribution shown on this side (Pl. 1) probably represents only a few tons of mineable ore. Near the hanging wall of the tactite, exposed in the south side of the pit, the scheelite distribution is more uniform averaging approximately 0.60 percent WO_3 in the tactite sampled in 1-P, 2-P, and 3-P.

In the underground workings the distribution of scheelite is fairly uniform, with the weighted average of 5 samples being approximately 0.60 WO_3. In the two southernmost exposures, however, the tactite body has thinned to 2 feet, indicating that it pinches with depth.

Reserves

About 7,600 tons of indicated ore containing approximately 0.60 percent WO_3 remain in the No. 1 area. The reserves were calculated in two blocks, A and B, the outlines of which are shown on Plate 1. Of the total, block A contains 4,800 tons (2880 units) and block B contains 2,800 tons (1680 units). In arriving at the reserve tonnage the following assumptions were made: the tactite layer dips south 20°, averages 8 feet thick, contains 0.60 percent WO_3, and averages 10 cubic feet per ton.

Exploration

Of the two blocks of reserves, block A is the only one large enough to warrant expenditure for exploration. Only a small additional tonnage could be expected by further exploration of block B.

Although the indications are that the tactite layer pinches with depth, this should be substantiated by further exploration as reserves in block A could be increased considerably if the ore is found to extend deeper than that presently exposed. The inclined shaft should be steepened where the tactite dips beneath the floor and sunk about 20 feet deeper in the tactite, or less if the layer pinches out within this distance. A drift should then be driven N. 60° W. about 150 feet to the westernmost extent of the tactite body. The drift should be driven from the deepest exposure of ore in the inclined shaft and should be kept within the tactite body for the entire distance.

Allowing costs of $40.00 per foot for sinking and $25.00 per foot for drifting, total exploration costs in the No. 1 area should be about $4,550.00.

NO. 10 AREA

The No. 10 area is about a half mile N. 77° E. of the No. 1 pit (Fig. 1). Workings in the No. 10 area include a pit, approximately 240 feet by 100 feet in plan and 40 feet in maximum depth, and an inclined shaft that is currently under construction and was 10 feet deep when the mine was examined (Pl. 2). Cover in the form of rubble from pit digging operations, alluvium, and slope wash obscure the bed rock over much of the area. A scheelite-bearing zone at least 60 feet long, ranging from 3 to 12 feet in thickness, is within calc-silicate rock. Both the scheelite-bearing zone and the calc-silicate rock strike N. 50°-70° E. and dip southeasterly about 60°. Marble, granodiorite, and a mixed zone of granitic and metamorphic rocks are also exposed in the area.

Cover precludes delimiting the size of the scheelite-bearing body. Exposures in the eastern part of the pit indicate that granodiorite abuts the ore zone to the northeast within 10 or 20 feet of its exposed northeastern limit. The lateral extent of the scheelite-bearing rock west of the shaft is probably considerably greater. Information as to the depth of the ore body, other than that it is exposed in the bottom of the 10-foot inclined shaft with no apparent thinning, is not available.

Sampling

Ten samples were cut in the No. 10 area (Pl. 2) and assayed by the Hydrometallurgical and Ore-Dressing Branch of the U. S. Bureau of Mines in Reno, Nevada. Samples 10-1 and 10-2 are channel samples cut perpendicular to the strike of the ore body, 8 and 4½ feet long

respectively. Samples 10-G and 10-H are 3-foot long chip samples taken across ore in the inclined shaft. Samples 10-A to 10-D are chip samples that were cut along the pit face, largely in scheelite-poor calc-silicate rock. Samples 10-E and 10-F are vertical grab samples taken in scheelite-bearing alluvium. Following is a tabulation of sample data for the No. 10 area:

Sample No.	Type	Length (in feet)	Percent WO_3
10-1	channel	8	0.24
10-2	channel	4½	1.94
10-A	chip	9	*0.01
10-B	chip	20	*0.01
10-C	chip	13½	0.09
10-D	chip	18½	*0.01
10-E	grab	6	*0.01
10-F	grab	3	0.20
10-G	chip	3	0.92
10-H	chip	3	0.32

* less than

Based on the following assumptions about 900 tons of reserves containing approximately 0.60 percent WO_3 are inferred: the ore body is 5 feet in average thickness over a length of 60 feet and extends 30 feet down dip and 10 cubic feet of ore weighs one ton. Inferred ore is also believed to exist beyond the exposed lateral extremities as the unexposed strike length is doubtless greater than 60 feet. Additional inferred ore is contingent on the down-dip extent of the ore body, which is probably greater than the assumed 30 feet.

Exploration

Applicant's proposal.--The applicant proposes to sink a 100-foot shaft from the bottom of the present open pit, drift in both directions on the footwall of the tactite body, and explore underground with

short diamond drill holes. They also propose to diamond drill from the surface in the area south of the exposed ore and follow a program indicated by geological study of the structure.

Geologists' proposal.--With the exception of diamond drilling, the applicant's proposal seems feasible. Specifically, a 100-foot inclined shaft down the dip of the ore body and two 30-foot long drifts along the ore body from the bottom of the shaft are proposed by the writers. The westerly lateral extent of the ore body on the surface should be ascertained by surface trenching. This could probably best be done by exposing the bedrock in 10-foot long, 2-foot wide crosscut trenches at the sites indicated on Plate 2.

Short diamond-drill holes from the underground workings are not likely to reveal enough information to justify their use. Diamond drilling from the surface is not recommended for the following reasons:

(1) several long drill holes would be necessary to approximately delineate the steep-dipping ore body

(2) previous diamond drilling in the Starbright area was encumbered by poor core recovery and operational difficulties

(3) diamond-drill holes would not give an accurate concept of the ore as they might pass through rich or lean zones

Costs.--Exploration costs at the No. 10 workings computed on a cost per foot basis would be $5,700. This figure includes:

100 feet of shaft at $40.00 per foot	$4,000
60 feet of drifts at $25.00 per foot	$1,500
100 feet of surface trenching at $2.00 per foot	$ 200

OLD LIZ AREA

The Old Liz area is on a steep hillside about a quarter of a mile

S. 80° W. of the No. 1 pit and at slightly higher altitudes (Fig. 1). Workings consist of a crosscut adit 25 feet long driven entirely in granodiorite and a small prospect pit. Easterly and northeasterly striking bodies of metamorphic rocks that dip 30°-60° south and southeast are probably roof pendants in granodiorite (Pl. 3). The metamorphic rocks consist mainly of impure quartzites, gneiss, marble, and tactite, with lesser amounts of silicated and siliceous limestone and schist. A few small irregular pods of quartz are associated with some of the tactite--notably in the prospect pit.

Scheelite is sparingly disseminated throughout most of the tactite, generally as crystals 2-5 mm long spaced at about 1-foot intervals. The only significant concentration of scheelite is in tactite above the crosscut adit where a zone about 10 feet long and 2 feet thick is indicated by lamping to constitute low- or medium-grade ore.

In several places the metamorphic rock-granodiorite contacts are strike faults, but these faults appear to manifest minor post-ore movements with little displacement. A few steep later faults cut the metamorphic rocks but have caused little displacement.

No samples were taken at the Old Liz workings because of the paucity of scheelite in most of the tactite and the apparent small size of the only potential ore body.

CONCLUSIONS

Government aid in exploring the No. 1 and No. 10 areas seems justified. Chances of discovering sizeable tonnages of ore depend mainly on the depth extent of the ore bodies, but even if the ore bodies are shallow, it is likely that enough ore will be found to compensate for exploration costs.

WASHINGTON 25, D. C.

OFFICIAL BUSINESS

400

DEC 1 - 1953

Mr. H. C. Miller, Executive Officer
DMEA Field Team, Region III
1012 Flood Building
870 Market Street
San Francisco 2, California

Re: Docket No. DMEA 3204 - Tungsten
Bruce Atchison
The Starbright Mine
San Bernardino County, California

Dear Mr. Miller:

The subject application for exploration assistance is being referred to your office for a field examination of the property.

A memorandum of November 24, 1953, by T. P. Thayer of the Geological Survey, is enclosed for your information.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee

Enclosure

APPROVED:

J. H. Hedges

Member, Bureau of Mines

D. M. Larrabee

Member, Geological Survey

cc: Docket
FT, Reg. 3
Code 400
Oper. Committee
Adm. Read. File
R. V. Geehan, USBM
T. P. Thayer, USGS

la 11/27/53

400

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

November 24, 1953

Memorandum

To: W.S. Martin, DMEA

From: T.P. Thayer, USGS

Subject: DMEA-3204 Tungsten
The Starbright Mine
San Bernardino, California

The applicant proposes to spend about $60,000 on diamond drilling and underground work on three claims of the Starbright group - Old Liz, No. 1, and No. 10.

The maps submitted with the report are insufficient to serve as basis for the proposed work, or to lay out a program, and no copy of the Survey report by Mr. Thane McCullough is available in Washington.

The production record of the mine fully justifies DMEA consideration of exploration, and it is recommended that the application be referred to the Field Team. It is to be hoped that the $2,000 allowed for geology in the estimate will result in a more adequate product than the present report.

The Field Team should, of course, consult with Mr. McCullough or obtain a copy of his report.

T.P. Thayer

Copy [illegible]

400

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
NOV 6 1953

PLEASE REPLY TO:
179 NO. SALTAIR AVE.
LOS ANGELES 49, CALIFORNIA
ARIZONA 9-2976 CABLES: COLBERT

November 6, 1953

The Administrator
Defense Minerals Exploration Administration
U. S. Department of the Interior
Washington, D. C.

Dear Sir,

Application is made for a loan for the conduct of an exploration project for tungsten trioxide-bearing ore at The Starbright Mine, San Bernardino, California.

The Starbright Mine area has been the subject of a U. S. G. S. study. Report has not yet been published.

The attached papers are believed to support the application.

Yours very truly,

Bruce Aitchison

BRUCE AITCHISON

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

Form Approved.
Budget Bureau No. 42-R1035.2.

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
NOV 10 1953

APPLICATION FOR AID IN AN EXPLORATION PROJECT, PURSUANT TO DMEA ORDER 1, UNDER THE DEFENSE PRODUCTION ACT OF 1950, AS AMENDED

Not to be filled in by applicant

Docket No. DMEA-3204
Metal or Mineral
Date Received 11-9-53
Estimated Cost
Participation (Government %)

INSTRUCTIONS

1. *Name of applicant.*—(*a*) State here your full legal name, in the form in which you will wish to contract, and your mailing address: Bruce Aitchison, 139 North Walnut Avenue, Los Angeles 49, California

(*b*) If other than an individual, add to your name above whether a corporation, partnership, etc., and the name of the State in which incorporated or otherwise organized.

(*c*) If a corporation, add to above statement, titles, names and addresses of officers.

(*d*) If a partnership, add to the above statement the names and addresses of all partners.

2. *General.*—Read DMEA Order 1, "Government Aid in Defense Exploration Projects," before completing this application. Submit this application and all accompanying papers in quadruplicate (four copies), with your name and address on each sheet of the application and on all accompanying papers. Where sufficient space is not provided on the form for all required information, state it on an accompanying paper, with a reference in each case to the instruction to which it refers by number. Comply with all applicable instructions; or, if not applicable, so state. File the application with Defense Minerals Exploration Administration, Department of the Interior, Washington 25, D. C., or with the nearest field executive officer thereof.

3. *Applicant's property rights.*—(*a*) State the legal description of the land upon which you wish to explore, including all land which you possess or control that may be benefited by the exploration, and excluding any land or interest in land which is not to be included in the exploration project contract Old Big Hungatite No. 1 and Star Bright Nos. 1 through 21 inclusive, located in Sections 19 and 20, T. 12 N., R. 1 W., San Bernardino Meridian, San Bernardino, California, and Star Bright Nos. 18, 19 and 20, Sections 22 and 27, T. 32 S., R. 47 E., Mount Diablo Meridian, San Bernardino County, California

(*b*) State any mine name by which the property is known. The Starbright Mine.

(*c*) State your interest in the land, whether owner, lessee, purchaser under contract, or otherwise Purchaser under contract.

(*d*) If you are not the owner, submit with this application a copy of the lease, contract, or other document under which you control the property.

(*e*) If you own the land, describe any liens or encumbrances on it

(*f*) If the land consists of unpatented claims, add to the description above, the book and page numbers for each recorded location notice. See appended sheet.

4. *Physical description.*—(*a*) Describe in detail any mining or exploration operations which have been or now are being conducted upon the land, including existing mine workings and production facilities. State your interest, if any, in such operations. Also describe accessibility of mine workings for examination purposes. See appended sheet.

(*b*) State past and current production, and ore reserves, if any, giving quantities and grades. See appended sheet.

(*c*) Describe the geologic features of the property, including mineralization, type of deposit (vein, bedded, etc.), and your reasons for wishing to explore. Illustrate with maps or sketches. Send with your application (but not necessarily as a part of it) any geologic or engineering report, assay maps, or other technologic information you may have, indicating on each whether you require its return to you. See appendices.

(*d*) State the facts with respect to the accessibility of the project: Access roads, distances to shipping, supply and residence points. See appended sheet.

(*e*) State the availability of manpower, materials, supplies, equipment, water, and power. See appended sheet.

5. *The exploration project.*—(*a*) State the mineral or minerals for which you wish to explore Scheelite

(*b*) Describe fully the proposed work, including a map or sketch of the property showing a plan (and cross sections if needed) of any present mine workings, and the location of the proposed exploration work as related to such features as contacts, veins, ore-bearing beds, etc. See appended sheet.

(*c*) The work will start within 5 days and be completed within 9 months from the date of an exploration project contract.

(*d*) State the operating experience and background of the applicant with relation to the ability to carry out such exploration project, and also that of the person or persons who will supervise the operations. See appended sheet

6. *Estimate of costs.*—Furnish a detailed estimate of the costs of the proposed work (you will have to use a separate sheet), under the following headings. Add the totals under all headings to give the estimated total cost of the project:

(*a*) *Independent contracts.*—(Note.—If the applicant does not intend to let any of the work to contractors, write "none" after this item. To the extent that the work is to be contracted, do not repeat the cost of the contract-work in subsequent items.) State the cost of any proposed independent contracts for the performance of all or any part of the work, expressed in terms of units of work (such as per foot of drilling, per foot of drifting, per hour of bulldozer operations, per cubic yard of material moved, etc.). See appended sheet.

(*b*) *Labor, supervision, consultants.*—Include an itemized schedule of numbers, classes and rates of wages, salaries or fees for necessary labor, supervision and engineering and geological consultants. See attached sheet.

(*c*) *Operating materials and supplies.*—Furnish an itemized list, including items of equipment costing less than $50 each, and power, water and fuel. See attached sheet.

(*d*) *Operating equipment.*—Furnish an itemized list of any operating equipment to be rented, purchased, or which is owned and will be furnished by the Operator, with the estimated rental, purchase price, or suggested use-allowance based on present value, as the case may be. See appended sheet.

(*e*) *Rehabilitation and repairs.*—Furnish a detailed list showing the cost of any necessary initial rehabilitation or repairs of existing buildings, installations, fixtures, and movable operating equipment, now owned by the Operator and which will be devoted to the exploration project. None.

(*f*) *New buildings, improvements, installations.*—Furnish a detailed list showing the cost of any necessary buildings, fixed improvements, or installations to be purchased, installed or constructed for the benefit of the exploration project. See appendix.

(*g*) *Miscellaneous.*—Furnish a detailed list showing the cost of repairs to and maintenance of operating equipment (not including initial rehabilitation or repairs of the Operator's equipment), analytical work, accounting, workmen's compensation and employers' liability insurance, and payroll taxes. See attached sheet.

(*h*) *Contingencies.*—Give an estimate of any necessary allowances for contingencies not included in the costs stated above. See attached sheet.

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*) Are you prepared to furnish your share of the cost of the proposed project in accordance with the regulations on Government participation (Sec. 7, DMEA No. 1)? Yes.

(*b*) How do you propose to furnish your share of the costs?

[X] Money [X] Use of equipment owned by you [ ] Other

Explain in detail on acompanying paper. See attached sheet.

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.

Dated October 23, 1953

Bruce Allen
(Applicant)

By BRUCE ALLEN JR

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

U. S. GOVERNMENT PRINTING OFFICE 16—66551-1

BOOK 3210 PAGE 296

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
NOV 9 1953

AGREEMENT FOR SALE
of
MINING PROPERTY

THIS AGREEMENT made and entered into this 9th day of July, 1953, by and between CLAIR W. DUNTON and A. C. LAMBERT, hereinafter referred to as "First Parties", and CLYDE BRUCE AITCHISON, JR., hereinafter referred to as "Second Party",

W I T N E S S E T H:

1. First Parties for and in consideration of the moneys to be paid, as hereinafter provided, and the covenants and agreements hereinafter reserved and by Second Party to be kept and performed, agree to sell and convey unto Second Party all of those unpatented mining claims and mining property situated in San Bernardino County, State of California, more particularly set forth and described in EXHIBIT A attached hereto and by reference made a part hereof, all of which properties are hereinafter referred to as the "Starbright Mine" or "the mine".

Second Party covenants and agrees to buy said Starbright Mine on the terms and conditions and for the price hereinafter set forth.

2. The purchase price for said Starbright Mine shall be paid to First Parties by Second Party in the following installments at the following times;

(a). $10,000 cash upon the execution of this agreement;

(b). $10,000 cash on the 90th day after the execution of this agreement;

(c). $10,000 cash on the 180th day after the execution of this agreement;

(d). An additional sum computed, determined and paid as follows:

If within ten (10) years from the date of this agreement the gross mill, mint or smelter returns from all ore or products removed or sold from said premises by Second Party, his sublessees or assignees equal the sum of $300,000, then Second Party agrees thereafter to pay to First Parties a sum equal to five (5) per cent of the gross mill, mint or smelter returns from all other and additional ore or products removed or sold from said premises during the said ten (10) year period, provided that such additional payment shall not in the aggregate exceed the sum of $35,000.

The payments, if any, to be made pursuant to this subparagraph (d) shall be paid to First Parties by Second Party within ten (10) days after Second Party has received the proceeds from any sale of ore or products removed or sold from said mine. At the time of any such payment, Second Party shall furnish First Parties with a written statement, certified to by Second Party or some managing agent of Second Party, showing the amount of ore sold or removed, the sales price thereof, the purchaser thereof, and the date of the payment of the proceeds of said sale.

3. On or after the commencement of the term of this agreement, Second Party shall have during the existence of this agreement the exclusive right to occupy said Starbright Mine for mining purposes, to mine and develop said

property, to prospect for, ship and market all ores and products therefrom, and shall be entitled to the use of all buildings, improvements and appurtenances erected thereon and used in connection therewith for the purpose of developing said property, prospecting for, shipping and marketing all ores and products therefrom.

4. Second Party may abandon the mine herein described and surrender this agreement at any time after one year from the date hereof by giving written notice to First Parties of such abandonment and surrender and by forfeiting all payments made under the terms hereof. In the event of such surrender, Second Party shall pay to First Parties as provided herein all moneys which have become due to First Parties pursuant to the terms and provisions of this agreement prior to the date of such surrender.

5. When First Parties have been paid the total sum of $65,000 pursuant to this agreement, or on the tenth anniversary of the date of the execution of this agreement, whichever date first occurs, if Second Party has fully performed all of the terms, conditions and covenants of this agreement, First Parties shall thereupon convey said mine to Second Party or his assigns unencumbered and with a merchantable title, subject, however, to the paramount claims of the United States of America. First Parties agree to execute such deeds or other documents of conveyance as may be necessary to vest title in Second Party or his assigns as provided herein. In the event of the cancellation or forfeiture of this agreement under the terms hereof, then and in that event said obligation to convey title shall cease and be of no effect.

6. Second Party during the term of this agreement shall at all times carry on his operations in a good,

careful and workmanlike manner so as to avoid as far as may be reasonably possible any damage or detriment to said property or any part thereof. Second Party shall work said mine and produce and sell ore therefrom so long as said operation is profitable. Second Party shall during all of said time procure and keep in full force and effect and pay for Workmen's Compensation Insurance and such other insurance as may be required by law. Second Party shall also during all of said period of time comply with all safety rules, regulations or orders relating to governmental bodies or any officer thereof with reference to the operation of said mine or any part thereof pursuant to the terms and provisions in this agreement.

7. Second Party agrees during the existence of this agreement to procure, carry and maintain upon all of his operations on the mine and relating thereto Comprehensive Public Liability Insurance with limits of not less than $100,000 for injuries to or death of any one person, and $300,000 for injuries to or death of two or more persons in any one accident, and $50,000 for damage to property. Second Party shall furnish First Parties with insurance certificates showing the above coverage and shall give ten (10) days' notice of cancellation or change before such cancellation or change becomes effective.

8. First Parties and the representatives or agents of First Parties shall at any and all reasonable times have access to said mine and the whole thereof for the purpose of inspecting the same.

9. All payments provided to be made in this agreement shall be paid to First Parties by mailing the same to Clair W. Dunton, 1145 Westminster Avenue, Alhambra, California, or to such other person and address as First Parties

may hereafter direct by written notice given to Second Party.

10. Second Party shall have posted at all times and keep posted in a conspicuous place on each of the mining claims herein agreed to be sold under this agreement a notice in writing to the effect that the work of developing and mining said premises and the construction or repair of any improvements thereon are being done wholly and solely at the expense of Second Party and said notice shall state that First Parties will not be responsible for any indebtedness for any labor, materials, or other expense created by Second Party in connection with the work and operation of said property during the existence of this agreement. Said notice shall be properly recorded by Second Party as required by law.

11. Second Party during the life of this agreement shall have the right to sublease any portions of said mine, subject, however, to the terms and provisions of this agreement and the payment of the sums due First Parties for all ore and products removed and sold by Second Party or any sublessee, agent or assignee during the term of this agreement. Upon the execution of any such sublease or assignment, Second Party shall forward a copy thereof to each of First Parties. This agreement may be assigned by Second Party, provided that such assignee shall first by written instrument agree to assume and perform each, every and all the terms, provisions and covenants required to be performed by Second Party.

12. Time is of the essence of this agreement and in the event of the failure of Second Party to make any of the payments provided for herein promptly when due, or to keep any of the covenants of this agreement, Second Party shall be deemed to be in default in the performance of this

agreement and should such default be continued and not be cured within thirty (30) days after receipt by Second Party from First Parties of written notice of such default, this agreement may be cancelled and all payments made hereunder shall be forfeited as liquidated damages and Second Party shall have no further right to said property or to purchase the same and shall peaceably surrender possession thereof to First Parties.

13. During the term of this agreement Second Party shall perform all annual labor or assessment work required by law upon the mining claims set forth in EXHIBIT A attached hereto and shall record proof of such annual labor as required by law.

14. Second Party shall keep full and complete accounts, books and records of the gross receipts received from the sale of all ores and mineral products produced from said mine and First Parties or their duly authorized agent shall have the right to examine said accounts, books and records at all reasonable times.

Second Party shall make available for inspection by First Parties or their duly authorized agents all logs, maps, assays, analyses and written reports which Second Party may receive or cause to be made regarding the exploration and tests of the mine or the ores therefrom.

15. During the term of this agreement Second Party shall pay all real and personal property taxes which may be levied or assessed upon the said mine, the improvements thereon, and any machinery, equipment, supplies or facilities or personal property placed thereon.

16. Second Party shall indemnify and hold First Parties free and harmless from and against any claims, demands, loss, liability or expense arising out of the occupancy, use or operation of the mine during the term of

this agreement.

17. Second Party shall have the right at his sole cost and expense to survey the mining claims described in EXHIBIT A, conduct exploratory and mining work thereon, and take and perform all necessary proceedings or procedures for the purpose of securing United States Letters Patent to the said mining claims or any portion thereof or additions thereto.

18. During the term of this agreement Second Party shall not by any act or omission permit or suffer any liens, encumbrances, or legal process to be incurred or levied upon the mine and Second Party agrees to promptly remove any lien or encumbrance so permitted or suffered.

19. Any notices provided for or required by this agreement shall be given by registered mail, postage prepaid, return receipt requested, addressed as follows:

To First Parties: Clair W. Dunton
1145 Westminster Ave.
Alhambra, California

A. C. Lambert

Barstow
California

To Second Party: Clyde Bruce Aitchison, Jr.
c/o William A. Beer
1628 Alta Avenue
Santa Monica, California

20. This Agreement shall inure to the benefit of and be binding upon the heirs, administrators, executors, successors or assigns of the respective parties hereto.

IN WITNESS WHEREOF said parties have executed this Agreement the day and year first above written.

Clyde Bruce Aitchison, Jr.

Clair W. Dunton

A. C. Lambert

SECOND PARTY

FIRST PARTIES

303

STATE OF CALIFORNIA,
County of Los Angeles } ss.

ON THIS 13th day of July, A. D., 19 53, before me, Glenn R. Seavey a Notary Public in and for said County and State, personally appeared Clair W. Dunton and A. C. Lambert, known to me, to be the persons whose names are subscribed to the within Instrument, and acknowledged to me that they executed the same.

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

Glenn R. Seavey
Notary Public in and for said County and State.

SEAL

ACKNOWLEDGMENT — GENERAL — WOLCOTTS FORM 232

BOOK 3210 PAGE 303

STATE OF CALIFORNIA,
County of Los Angeles } ss.

ON THIS 22nd day of May, A.D., 19 53, before me, Karaway Kenton a Notary Public in and for said County and State, personally appeared Bruce Aitchison, known to me, to be the person whose name is subscribed to the within Instrument, and acknowledged to me that he executed the same.

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

My Commission Expires Aug. 24, 1954

Karaway Kenton
Notary Public in and for said County and State.

SEAL

ACKNOWLEDGMENT — GENERAL — WOLCOTTS FORM 232

53703

MINERAL MATERIALS CO.

EXHIBIT A

AGREEMENT FOR SALE OF MINING PROPERTY
consisting of:

All claims located in Section 19 and 20, T 12 N, R 1 E San Bernardino Meridian.

Old Liz	Tungstite	Surveyed	Full claim
" "	" No.1	"	" "
Star Bright	No.1	Unsurveyed	Full claim
" "	2	"	" "
" "	3	"	" "
" "	4	"	" "
" "	5	"	" "
" "	6	"	" "
" "	7	"	" "
" "	8	"	" "
" "	9	"	" "
" "	10	Preliminary Survey	" "
" "	11	" "	" "
" "	12	" "	" "
" "	13	" "	" "
" "	14	" "	Fraction Claim
" "	15	" "	" "
" "	16	" "	Full Claim
" "	17	" "	Fraction Claim
" "	21	" "	" "

Sections 26, 27, T 32 S, R 47 E
MDB&M

Star Bright	No. 18	Preliminary Survey	Full Claim
" "	19	" "	" "
" "	20	" "	" "

PHOTOSTATED
COMPARED

RECORDER
REQUEST OF
ATTORNEY

INDEXED

Book 3210 Page 253
OFFICIAL RECORDS
SAN BERNARDINO COUNTY, CALIF.
JOHN R. POSTON, RECORDER

Eva Bennie Dep.

4.30
30

3f. Description of Recorded Location Notices

Name of Claim	Book	Page	Date
Old Liz Tungstite Lode Mining Claim	310	498	11/30/49
Old Liz Tungstite No. 1	310	499	11/30/49
Star Bright No. 1	312	133	4/14/50
Star Bright No. 2	312	267	5/1/50
Star Bright No. 3	312	268	5/1/50
Star Bright No. 4	312	269	5/1/50
Star Bright No. 5	315	60	8/17/50
Starbright No. 6	315	61	8/17/50
Star Bright No.7	315	62	8/17/50
Star Bright No. 8	315	63	8/17/50
Star Bright No. 9	315	64	8/17/50
Star Bright No. 10	318	5	3/27/51
Star Bright No. 11	318	6	3/27/51
Star Bright No. 12	327	556	8/7/52
Star Bright No. 13	327	558	8/7/52
Star Bright No. 14	327	560	8/7/52
Star Bright No. 15	327	562	8/7/52
Star Bright No. 16	327	564	8/7/52
Star Bright No. 17	327	566	8/7/52
Star Bright No. 18	327	568	8/7/52
Star Bright No. 19	327	570	8/7/52
Star Bright No. 20	327	572	8/7/52
Star Bright No. 21	327	574	8/7/52

All of San Bernardino County, California

The original of a title guarantee (No. 275,709) of Pioneer Title Insurance and Trust Company, San Bernardino, California, June 17, 1953, is attached to the original of this application. No copies are available.

KING & KING

MINING ENGINEERS

October 26, 1953

Mr. Bruce Aitchison
139 No. Saltair Avenue
Los Angeles 49, California

Dear Mr. Aitchison:

We herewith submit our report upon the Starbright tungsten property.

At your request, we have confined this report to recommendations for an exploration program commensurate with the possibilities of the property, and of sufficient magnitude to determine the size, attitude, and grade of probable orebodies lying below former workings. In the course of such an exploration program, it is probable that presently unknown orebodies may be discovered within the group of claims, or nearby.

The data and recommendations herewith are based upon our examination and report made for you, dated March 31st, 1953; and upon subsequent frequent visits to the property.

Our recommendations, detailed in the report herewith, are, briefly:

(1) Prior production, present ore showing, and favorable outcrops upon the property merit an intelligently planned exploration program estimated to cost approximately $60,000, and which should be completed within nine months from the time work starts.

(2) A provision has been made in the above estimate for a geological study and mapping, since we believe a close study of structure may result in the discovery of presently unknown orebodies in the large areas of favorable formation present upon the property. In this connection, the property and surrounding area has been studied by the U.S.G.S., and the work is reported in an unpublished manuscript by Thane McCulloh. Were this report available, it would be of great value in planning any exploration program.

Very truly yours,

KING & KING, by:

C. R. King

Clarence R. King

Dan M. King

Dan M. King

CRK:VJ

Enc.: Report upon Starbright
Tungsten Property

KING & KING

MINING ENGINEERS

REPORT UPON THE STARBRIGHT TUNGSTEN MINE

SAN BERNARDINO COUNTY, CALIFORNIA.

Location and means of access.

The Starbright tungsten property is about 27 miles northeast from Barstow, California, (see index map herewith). From Barstow, the property is reached by proceeding 20 miles on the paved Camp Irwin highway, then 4½ miles upon an excellent graded dirt road to the mine. Barstow is the nearest railroad point.

Titles and acreage of claims.

Investigation of title is beyond the scope of this report. The Starbright property consists of 23 unpatented lode claims, which, because of overlap, reduce the acreage held to approximately 439. The claims are properly monumented and plainly marked on the ground, (see claim map herewith).

History of the property.

The Starbright No.1 orebody was found in April, 1950, by Mr. A.C.Lambert, who had previously been prospecting south-west of the present holdings, and also upon the Old Liz Tungstite claim now within the Starbright group. From the discovery to July, 1953, it is reported that about 10,000 tons of ore varying in grade from less than 1% WO_3 to over 2% WO_3 were hauled to custom mills at Barstow and Bishop, Cal. About 3/4 of this tonnage was taken from the No.1 open pit; the remainder was mined from the No.10 open pit and a small amount from shallow underground workings at No.1 pit. In July, 1953, the Starbright holdings were acquired by Mr. Bruce Aitchison. Since that date the property has been under development by the present owner.

General information.

The topography near the property is typical of the Eastern Mojave Desert (see index map). Small steep-sided ranges, the peaks of which attain elevations of 3000 to over 5000 feet are interspersed with bare rolling hills and fanglomerate-filled valleys. The Starbright claims are situated upon the north-east flank of Lane Mountain, in the low foothills of this range.

The elevation of the property is approximately 3000 feet at the Starbright No.1 pit; relief is perhaps a hundred feet lower at the No.10 pit, to 200 feet higher at the highest outcrop of ore on the Old Liz Tungstite claim.

The climate is typical of the Mojave Desert; hot and dry in the summer but with fairly cool nights; cold and windy in the winter. Temperature range in the summer is from a maximum of about 120° F at noon to 70° at midnight; in the winter from about 75° at noon to below freezing at night. Precipitation is approximately 5" annually.

Labor supply would be derived from Barstow, Randsburg, and nearby communities. There are no living facilities upon the property. All labor and supervision travel the 25 miles from Barstow and return each day. Wage scale as of July, 1953 was $2.25 per hour for skilled miners, other categories in proportion.

No water supply other than one small spring is found on the property. Williams wells, about six miles south-west, will furnish about ten gallons per minute of water unsafe for domestic consumption because of alkali and arsenic content. The nearest substantial water supply is on the west edge of Coyote Lake, about six miles east of the property. Wells at this point have a low-head artesian flow, and the water is being used for domestic purposes.

Power supply for the property would be deisel or gasoline driven prime movers. The nearest source of electrical energy is the high-line to Camp Irwin, distant about five miles. Other than this, the main Boulder Dam- Los Angeles transmission lines are about 25 miles east of the property.

Fuel, timber and all supplies would be hauled from Barstow.

Equipment on the property consists of three buildings suitable for shop and tool sheds; and mining equipment necessary for a production of about 75 tons of ore per day. For detailed inventory of equipment, see D.M.E.A. application to which this report is attached.

Economic Geology.

The property and nearby area has been studied and mapped by the U.S.G.S., and is the subject of an unpublished report by Mr. Thane McCulloh. The geology near the No.1 pit has also been described in the California Journal of Mines and Geology, Vol.48, No.3, July, 1952.

Briefly, the regional rocks upon and near the property are a complex of plutonic rocks of generally basic composition ranging from diorite to gabbro. This igneous complex contains septa of metamorphosed sediments ranging from quite pure limestone to mica schist in composition, as well as some quartzite members. Igneous contacts with the metasediments usually are marked by zones of highly silicious rock composed of quartz with garnet, epidote, diopside and calcite; which zones shade into soft, high-garnet tactite areas in many places. The tactite apparently is the principal host-rock for the scheelite mineralization. Wherever noted, the tactite is minutely fractured and crushed.

A series of faults with apparent small net displacement cuts all formations and trends generally north-east with a southerly dip. Some of these may be premineral. The detailed structure has not been mapped, unless such data are included in the report by McCulloh.

Some of the tactite areas, where scheelite mineralization of ore grade has been discovered to date, are shown on the claim map herewith. The apparent relation of the tactite zone at No.1 workings is shown on the map of the No.1 Pit, herewith. Insufficient study and lack of surface geological data have made the interpretation of structure difficult, but the sections as plotted from available underground data indicate in a rough way the trend of the tactite zone at No.1.

Ore Reserves.

There are no blocked (assured) ore reserves upon the property in the generally accepted definition of the term. The following estimates of probable ore are based upon the small amount of development done to date, interpreted in the light of experience with similar tungsten deposits.

No.10 area:

An extension in depth of presently outcropping ore equal to half the length of the outcrop would indicate . . . . 2000 tons at 0.5%

No.1 Pit area:

(a) Underground work, east side of the shaft, indicates. . . . 5000 tons at 0.6%

(b) West end of pit, extension underground, indicates. . . . . 4000 tons at 0.6%

(c) No.1 pit waste dump, sampling indicates . . . . . 7000 tons at 0.2%

O ld Lis area:

No development work done: outcrops allowed half of length in depth, which after applying a stoping factor of 0.5: . . . 1500 tons at 0.6%

Summarizing: a total of 19,000 tons.(in round numbers) of ore of an average grade of 0.45% WO3 may reasonably be expected after exploration and development of the three known orebodies, without taking into consideration possible extensions below fifty feet vertically under present outcrops or faces.

If the average ore as mined is sorted to a shipping grade of 1% or higher, experience with the Starbright ore indicates that of the total assumed tonnage of probable ore, (after subtracting the 7000 tons of dump material(rejects from previous sorting), about 40% would report as sorted 1% ore, or 5000 tons at 1%. Of this probable ore, it would be safe to assume about 1/5, or 1000 tons at 1%, is assured ore.

The estimates of grade in the foregoing were made by "eye assay" with untraviolet lamp, checked by general samples taken at critical points after estimating grade with the lamp. Chemical determination of WO3 was made by Ed. Eisenhauer, Jr. of Los Angeles, upon these samples. Estimation of ore grade by lamping , at the Starbright property, is reasonably accurate if checked frequently by chemical determination. The scheelite occurrs as a fine dissemination rather than as coarse, isolated crystals; which dissemination aids estimation by lamping. Former operators sorted and shipped entirely by lamping and depended upon mill returns on each lot to check lamping results.

Recommended Development.

The Starbright property must be considered a prospect, even if some 10,000 tons of profitable ore has been shipped from the mine. The three known outcrops of ore have been only partially developed, or not at all, and other outcrops of tactite, some of which are mineralized as indicated by scheelite "float", have not been either mapped or prospected in any way.

The logical way of exploring the potential of the property is to develope known outcrops laterally and in depth; at the same time as a close mapping and geological study of the structure is under way. There is a strong probability that this study will disclose orebodies other than those known; and will in any case guide development work with consequent saving in cost and probable increase in ore reserves.

The following immediate program of exploration and development is recommended:

(1) A detailed geological map should be prepared, covering the property and the surrounding terrain; and the structure and rock types noted. Favorable areas should be prospected as budget and time permits.

(2) At the No.1 area, the following work is recommended,(see map herewith):
(a) Sink the present shaft thirty feet below present bottom, and drift east 200 ft.(or more if the tactite persists). Explore the tactite zone from this level with short diamond drill holes.
(b) Explore the tactite zone from the present sub-level with diamond drill holes, to the east, in the footwall, and down-dip in the hanging wall area.
(c) Explore the west side of the shaft at the sub-level with diamond drill holes.
(d) Diamond drill from the surface if indicated by the geological study and the results of the underground exploration.

(3) At the No.10 area: the following work is recommended:
(a) Sink on ore from the bottom of the present open pit to approx. the 100 ft. level and drift north and south upon the footwall of the tactite body. Explore with short diamond drill holes from this level.
(b) Diamond drill from the surface in the area to the south of the presently exposed ore, as indicated by the geological study of structure.

(4) Old Lig area: the following work is recommended:
(a) Drift on the footwall of the tactite zone from a point now prepared for a drift portal; which point is on the lowest point on the outcrop of this tactite zone. Drift approx. 300 feet south on this zone, at which point the face of the drift will be approx. 200 to 300 feet dip-slope distance below the highest outcrop of ore.
(b) Explore the tactite zone with diamond drill holes from the drift level.
(c) Diamond drill from the surface if indicated by the geological study.

We estimate that the foregoing program of exploration should be completed within nine months from the date work starts. It is difficult to make a detailed estimate of cost, in view of the fact that as the work progresses, especially the completion of the geological mapping and study, the emphasis may shift from underground work to diamond drilling, or vice-versa; and some surface trenching may be advisable. However, for purposes of fixing a budget, and assigning relative amounts of money to be spent upon each of the three known orebodies, the following summary should cover the cost of necessary work.

Item	Estimated cost
(1) Geological mapping and study	$ 2,000
(2) No.1 area exploration	11,000
(3) No.10 area exploration	14,000
(4) Old Liz area exploration	10,000
Engineering & supervision	8,000
Assaying and accounting	4,000
Fixed charges, insurance, and overhead	4,000
Contingencies, 10%	5,300
Total estimated cost of exploration program.	$ 58,300

In round numbers, $60,000 should cover an exploration program which would definitely fix the potential of the Starbright property as a tungsten producer.

Conclusion.

The past production of the property,(reported to be about $900,000 in mill returns); present showing of ore at and near former workings; and the fact that favorable formations(tactite) occurrs at other points on the property which have not been explored; make the expenditure of $60,000 in exploration a justifiable mining risk. After the completion of the program as outlined under "Recommended Development", there is a reasonable expectation that orebodies aggregating more than 40,000 tons of an average grade between 0.5 and 1.0% WO_3 may be found; plus the possibility that presently unknown orebodies of like size may be discovered.

Respectfully submitted,

KING & KING, by:

C. R. King

Clarence R. King

Dan M. King

Dan M. King.

This report consists of:

Five typewritten pages.
Three maps.
One appendix:long hole drill logs.

4a. Description of past and present mining or exploration operations.

(1) Past operations. Mine was discovered in 1950, and former owners operated successfully for two years. Discoveries were made in several places, and active mining operations were conducted during 1951-1952.

Discoveries were made in three places. Attached to the Engineer's Report are maps revealing the general discovery areas. Of these areas, commercial mining was carried on in but one location.

Existing mine workings include (a) a crosscut at the "Old Liz" discovery, by means of which the miners attempted to discover and intersect a body of ore which outcropped at a higher point on the structure, but which failed to intersect the ore body and therefore was barren entirely; (b) Open cut mining operations at the so-called "No. 1" discovery, where extensive commercial mining operations were carried on in an ore body available to open cut operations, then a short shaft was driven into the ore body underground and a small amount of additional ore was mined; (c) Very brief open cut mining operations were carried on at the "No. 10" discovery and a small amount of ore was mined.

Past operations included some short diamond drill holes at No. 1 close to the open pit. This drilling revealed ore that was later mined. Two diamond drill holes at No. 10 workings are reported to have indicated the presence of ore that to date has not been developed or mined. No detailed records of these drill holes are available.

At "Old Liz" exists a short crosscut and a road. At No. 1 there are suitable buildings, a short shaft, a short drift and a complete system of roads. At No. 10 there is an exposed ore body, quantity and quality unknown, with a road and a tool house.

(2) Present operations. Present operators took over the property in July 1953, and conducted an extensive open-cut operation in an attempt to connect known outcrops of ore at No. 10 discovery. This operation has not been successful to date in establishing attitude and continuity of outcropping ore.

At No. 1 discovery, where commercial mining had been conducted in the past, a program of long-hole drilling was conducted by present operator (using private funds) and a 50-ft. winze was driven to a lower level than then-existing workings in an endeavor to establish dip and trend of the ore body. Long-hole drilling operations were generally inconclusive, and revealed principally the existence of tungsten-bearing ore, the grade and extent of which is unknown. The winze established that the ore body has taken a more sharp dip than had been anticipated from diamond drilling logs or other observations, and established the fact that the ore body continued to a much greater depth than anticipated. Quantity or quality of ore remains unknown.

No development or mining has been conducted by present operators at "Old Liz".

In performing development work, present operators have mined and shipped approximately 450 tons of ore, which has been milled. Grade at the mill has been low; results are inconclusive.

6b. Past and present production and ore grades.

(1) Past production. Former owners produced approximately 19,000 short tons of ore during the period 1951-1952. Of this ore, there was sorted and discarded all ore estimated to assay less than 1% WO_3, and an effort was made to ship only ore that assayed 1% WO_3 or better. A dump which has been measured, sampled and assayed by present operators, contains nearly 8,000 tons of ore and country rock, and the average tungsten content is estimated at 0.2% WO_3. The size of this dump, the size of the excavation and underground workings, and the information furnished by former operators indicate that the figure 19,000 tons is approximately the quantity of ore mined.

For a short time this mine was one of the better scheelite mines in the United States, and is well-known in local mining circles. It operated as a commercial success at a time when tungsten trioxide was sold domestically aturaround 25.00 per unit.

Former owners were partners, one living in Los Angeles and providing capital and equipment and the other living near the mine and providing supervision. A personality difference made it impracticable for further mining operations to be carried on, and mining efforts were given up in 1952 despite the presence of additional known ore. The operators had not carried on a plan to develop ore ahead of operations.

(2) Current Production. The mine is not presently in production.

(3) Grade of Ore. Past operations were carried on with shipments held to a grade of about 1% or better. Ore body is spotty, with lenses of high grade ore being discovered in a body of low grade ore. Grab samples have been taken assaying 5% WO_3. Former operators tell of ore pockets from which substantial tonnage was taken with WO_3 content near 12%. It is believed to be a fair statement, from observations of present operator and from measurements of ore previously mined and shipped, and from statements made by previous operators, that the average grade of ore is not less than 0.5% WO_3, and that by sorting this may be beneficiated to a shipping grade of 1.0%.

(4) Reserves. It is not safe to state that there is a proven reserve of ore of more than 1,000 tons, most of which is situated at No. 1 discovery.

The principal obstacle to success of this property in the past is believed to be a lack of proven reserves against which planning for a mill, for economical mining and for orderly development may be done.

4d. Accessibility of Project.

(1) Access Road. The property is readily available by highway. A paved highway extends northeast from Barstow, California, to Camp Erwin, passing within five miles of the property. From this highway an excellent all-weather road extends to the property. This road was constructed by the former operators. Within the property "No. 1" and "No. 10" are available by all-weather roads, and "Old Liz" has a somewhat inadequate access road but is only a few hundred feet distant from the all-weather road.

(2) Shipping Point. The property is 23 miles northeast of Barstow, California, by highway and road distance. At Barstow there is a mill where considerable ore had been milled by the prior operators and where ore can be milled at present.

Present operators have milled some ore at Sun Valley Mill, on the outskirts of Los Angeles, and at Bishop, California at the Red Hill Mill. These have been in the nature of test runs. It is considered that the property is too distant from Los Angeles or Bishop to permit regular shipments to these points.

(3) Residence points. Ample living facilities are available at Barstow, about 30 minutes distant by all-weather road.

(4) Supply point. Emergency supplies may be obtained at Barstow. General procurement of supplies is best done in Los Angeles. An overnight trucking service exists which delivers materials to the property, with pick-up in Los Angeles.

4e. Availability of Manpower, Materials, Supplies and Power.

(1) Manpower. To date the present operators have had no trouble in securing manpower. There seems to be no shortage whatsoever of skilled miners.

(2) Materials. Present operators have experienced no slightest difficulty in obtaining all desired or needed materials or supplies.

(3) Equipment. Equipment is in plentiful supply, and present operators have sufficient equipment for the job.

(4) Water and Power. There is no water on the property in appreciable quantities, and the water must be hauled from a well about 6 miles distant. A small well has been developed on the property, and considerable further development is needed before adequate water for even household use could be said to be developed. There is no power on the property. There is a high line 4 miles distant. Present operators have a 50KW, a 5K and a 1.5KW generator plant for power as needed.

5. Proposed work.

It is proposed that the following work be done:

(a) Exploration "Old Liz". The "Old Liz" area was considered by USGS geologist as the most favorable of any showing for exploration. Scheelite is found in outcrops indicating a formation possibly containing scheelite in substantial quantities at the "Old Liz" discovery. It is considered that the crosscut originally driven at "Old Liz" was driven an insufficient distance to intersect the ore body. The prospectors who drove the crosscut in 1950 considered that the ore body dipped much more substantially than it does, and they abandoned their crosscut when it was barren after they had gone beyond the point where they estimated the ore should be and when favorable results were obtained at "No. 1."

We propose to drift upon the outcropping ore from a point about 100 feet north of the old crosscut, in a generally southerly direction following the strike of the orebody a distance of approximately 300 feet, at which point the drift will be approximately 200 feet below the highest outcropping ore. We propose to explore the tactite zone with diamond drill holes from the drift level. We propose to diamond drill from the surface if indicated by geological study.

(b) Exploration No. 1. The workings at "No. 1" have already produced about $900,000.00 of mill returns, a considerable part of which was during the time when WO3 was around $25.00 per unit. There are strong indications, from surface observations, from long hole drillings, from a winze driven by us and from known deposits found in the open cut area or underground and not yet mined, that there is a body of scheelite ore not yet located.

We propose to sink the shaft thirty feet below present bottom, and to drift east 200 feet (or more if the tactite persists)., and to explore the tactite zone from this level with short diamond drill holes.

We propose to explore the present tactite zone from the present sub-level with diamond drill holes, to the east, in the footwall, and down-dip in the hanging wall area.

We propose to explore the west side of the shaft at the sub-level with diamond drill holes.

We propose to diamond drill from the surface if indicated by the geological study and the results of the underground exploration.

(c) Exploration No. 10. The work performed at "No. 10" indicates surface contact with a substantial ore body although likely spotty in grade. By hearsay, a diamond drill intersected this ore body at a depth of 70 feet.

We propose to sink on ore from the bottom of the present open pit to approximately the 100 foot level, and drift north and south upon the fottwall of the tactite body, and explore underground with short diamond drills.

We propose to diamond drill from the surface in the area to the south of the presently exposed ore, and follow a program indicated by the geological study of the structure.

(d) General. We propose to have a detailed geological map prepared covering

the property and the surrounding terrain. We propose to prospect favorable areas.

5d. Operating Experience of Applicant.

Applicant has conducted wolframite mining operations in Japan during 1950-51. Applicant is experienced as an engineer although not a mining engineer. Applicant has engaged in iron ore mining operations for his own account in Canada.

Operations will be supervised by Mr. C. E. King, a mining engineer, of Midway City, California. Mr. King has operated mines successfully for the past 30 years. He has been employed by the State of California as State Metallurgist, and is thoroughly experienced.

Mine foreman is Frank H. McCarthy, who has engaged in mining operations, both for his own account and for the account of others, in the Coeur d'Alenes, Idaho, for the past 15 years.

6. Estimated Cost.

A. "Old Liz. Drift 300 feet @ $28.00 (labor $12.00; supplies $9.00; equipment rental $9.00) inclusive of all costs, for a total cost of $8,400.00. Diamond drill holes, 700 feet @ $6.00 ($4.50 direct cost plus $1.50 indirect cost), total $4,200.00. Entire project "Old Liz" $12,600.00

B. "No. 1". Drift 200 feet @ $28.00 inclusive of all costs, $5,600.00. Diamond drill holes will cost $5,400.00. Entire project "No. 1" will cost $11,000.00.

C. "No. 10". Drive a shaft for 100 feet and drift for 100 feet for a total footage of 200 feet at a total cost of $9,200.00. Diamond drill holes will cost $4,800.00. Total project "No. 10" will cost $14,000.00.

D. General.

(1) Supervision of the above operations will cost $3,600.00 for foreman ($400.00 per month x 9 months), and $4,500.00 for engineering supervision ($500.00 per month x 9 months). Total cost will be $8,100.00

(2) Geological study and mapping will cost $2,000.00.

(3) Analytical work and assaying will cost about $120.00 per month, based upon our experience for the past 3 months. This does not include metallurgical studies. Total cost will be $1,080.00

(4) Full-time accounting and front office work such as handling of payroll has amounted to $525.00 monthly for the past three months. This is excessive. Cost of part-time work will be $2,920.00 for the nine-month period.

(5) Transportation costs have been running $240.00 monthly exclusive of carriage of ore. It is believed that they will continue at this rate as the property is so situated as to require considerable highway travel. Total transportation costs will be $2,160.00.

(6) Workmen's compensation insurance, including insurance upon contractors' employees, will be $990.00.

(7) Employer's liability insurance will be $135.00 for nine months.

(8) Payroll taxes will be $54.00 total, and will apply only against (4) above.

(9) Watchman services may be engaged for $100.00 monthly, or $900.00 total.

(10) Contingencies will be $5,000.00.

(11) Total cost of the project will be $60,939.00.

(Prevailing wages, included in the above, are $2.50 per hour for miners.)

6. Estimated Cost (Cont'd.)

The following operating equipment is owned by the applicant and is on the job or standing by and immediately available for the job:

Cat D7 Bulldozer	Mine hoist, 60 HP, 1000' cable
Allis-Chalmers HD14 Bulldozer	5 tons rail; cars
Schramm-Buda 420 cfm Diesel, 2 ea.	3 tons 2" pipe; air hose & connections
Ingersoll-Rand 315 cfm Diesel	International 50 KW Diesel MG set
CP 315 cfm Diesel	Leroi 5 KW MG set; Kohler 1½ KW MG set
Ingersoll-Rand 105 cfm gas	Ford 5 ton dump truck; Ford F100 pick-up
Ingersoll-Rand ½-ton slusher	50-ton ore bin; numerous houses
Numerous drifters and hammers	New 23' house trailer

Foregoing would be rented to contractors at prevailing rates such as used by Vernon Machinery Company Inc., of Los Angeles. Rental figures are included in the above project cost estimates.

Repairs and maintenance to equipment are for the account of contractors, included in the project estimates above.

Tabulation of costs is as follows:

Item	Estimated Cost
Geological mapping and study	$2,000.00
"Old Liz" area exploration	12,600.00
"No. 1" area exploration	11,000.00
"No. 10" area exploration	14,000.00
Engineering and supervision	8,100.00
Assaying and analysis	1,080.00
Accounting and front office	2,920.00
Transportation	2,160.00
Workmen's compensation	990.00
Employer's liability insurance	135.00
Payroll taxes	54.00
Watchman	900.00
Contingencies	5,000.00
TOTAL	$60,939.00

7b. Method of Applicant's
Furnishing Share of Costs.

The applicant proposes to furnish his share of the costs of this development in cash.

(The applicant will supply appropriate credit references upon request.)

(The applicant has spent since June 1953, inclusive of capital equipment and payments on the purchase contract, $90,042.60 in cash in the development of this property. The applicant considers that it is appropriate that the Government under its exploration program participate in the risk of the further development of this property as the Government has done in other cases.)

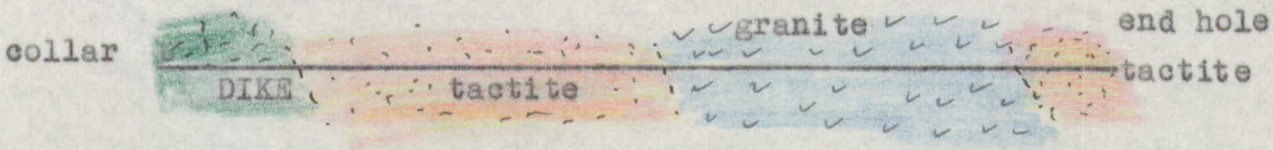
The applicant will receive from subcontractors a small amount of the additional development charges through rental of machinery and equipment (other than fixed equipment).

Thus the applicant will be supplying cash in part and equipment in part, although the applicant will match the Government's advance with his own money.

KING & KING
MINING ENGINEERS

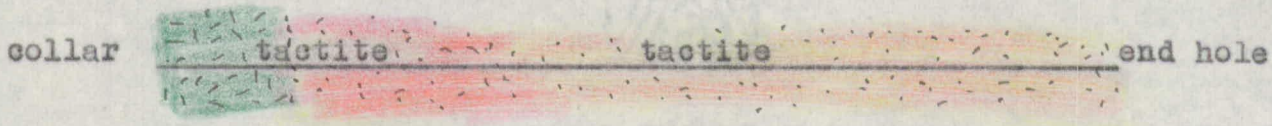
STARBRIGHT: GRAPHIC LOGS OF LONG HOLES

Long Hole No. 1:



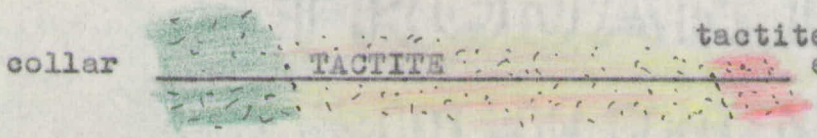
. . . . . .

Long Hole No. 2:



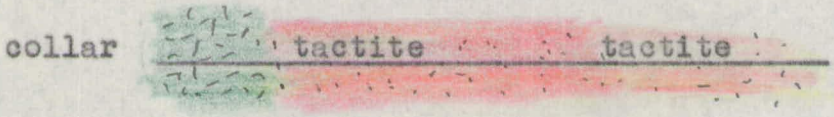
. . . . . .

Long Hole No. 3:



. . . . . .

Long Hole No. 4:

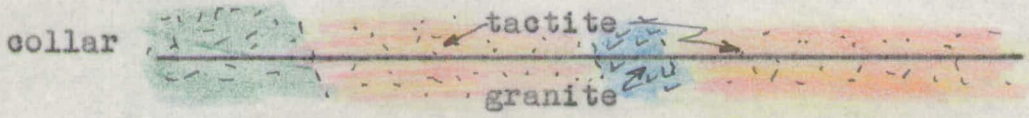


. . . . . .

Long Hole No. 5:

. . . . . .

Long Hole No. 6:

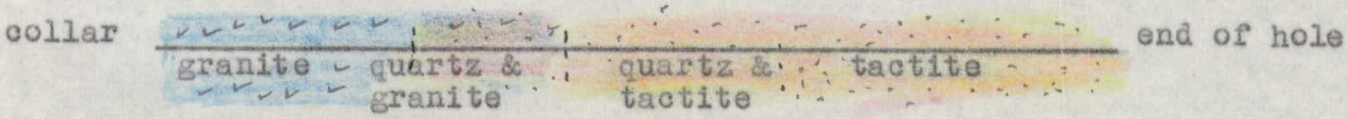


KING & KING

MINING ENGINEERS

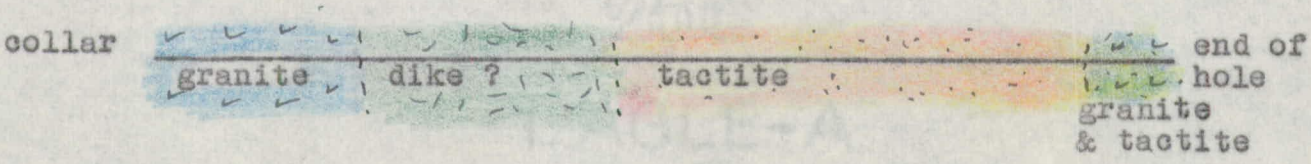
Starbright: Graphic Logs of Long Holes - Page #2

Long Hole No. 7:



. . . . . .

Long Hole No. 8:



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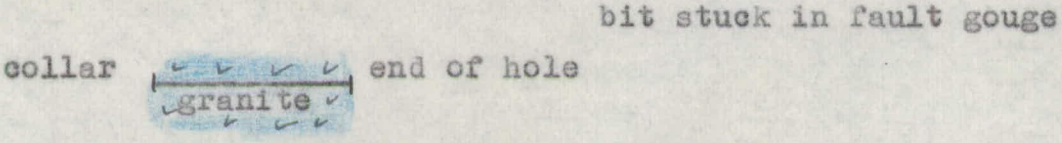
Long Hole No. 9:

. . . . . .

Long Hole No. 10:



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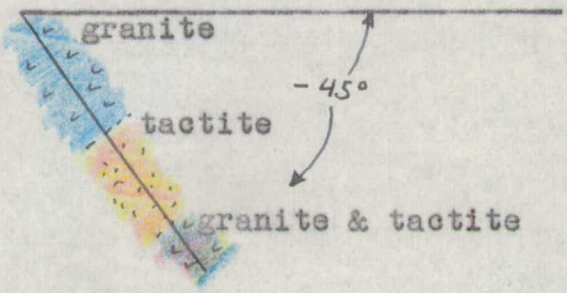
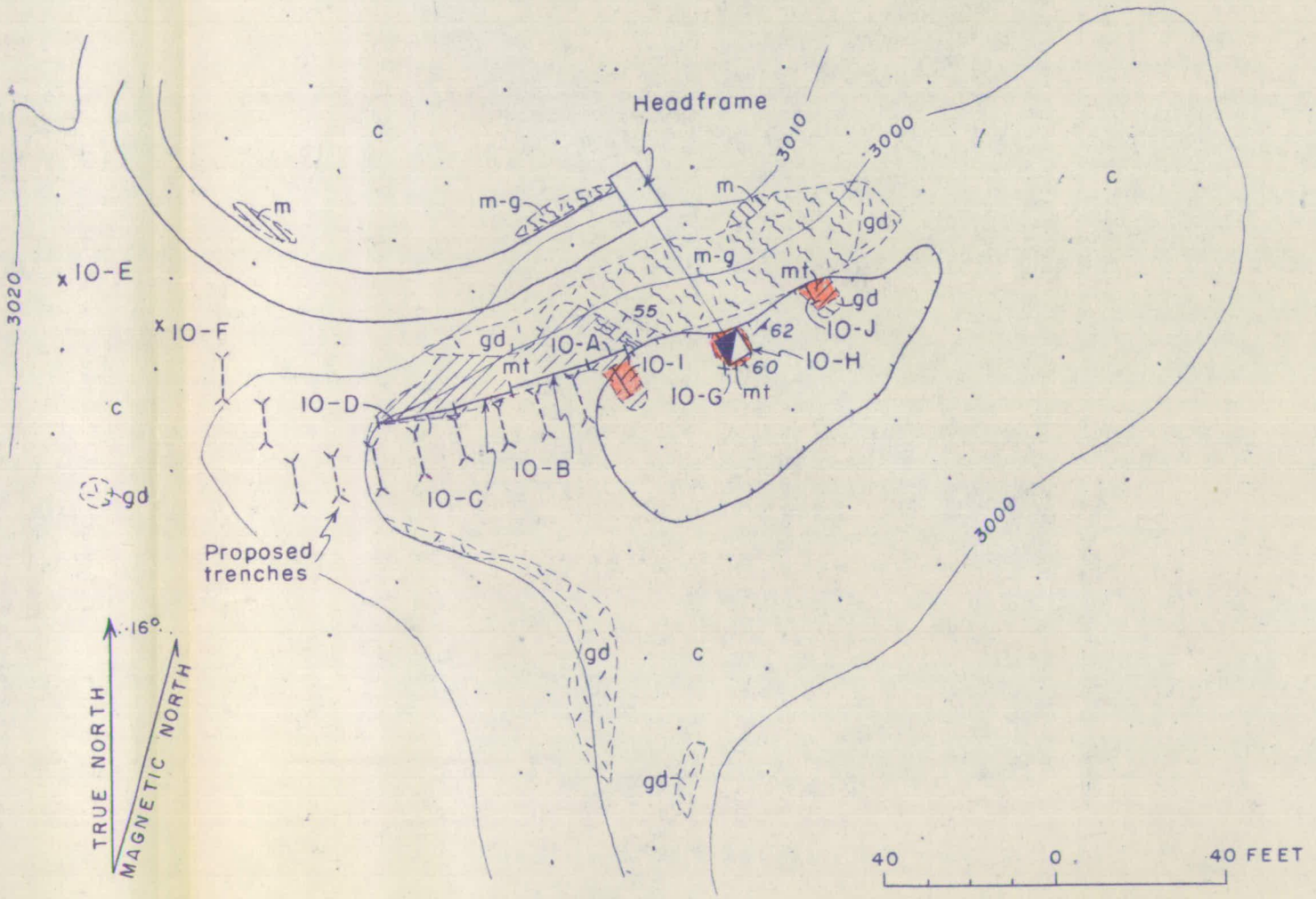
Long Hole No. 11:



UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

DMEA 3204
(TUNGSTEN)



Mapped by E. M. MacKevett and C. D. Rinehart
December, 1953

40 0 40 FEET

Contour interval 10 feet
Datum assumed

EXPLANATION

c
Cover
Includes alluvium, slope wash and fill

gd
Granodiorite

m-g
Mixed metamorphic and granitic rocks

m
Marble

mt — probable ore
Scheelite-bearing calc-silicate rock
Mainly tactite

40
Indefinite contact, showing dip

Shear zone

60
Strike and dip of foliation

x
Sample locality

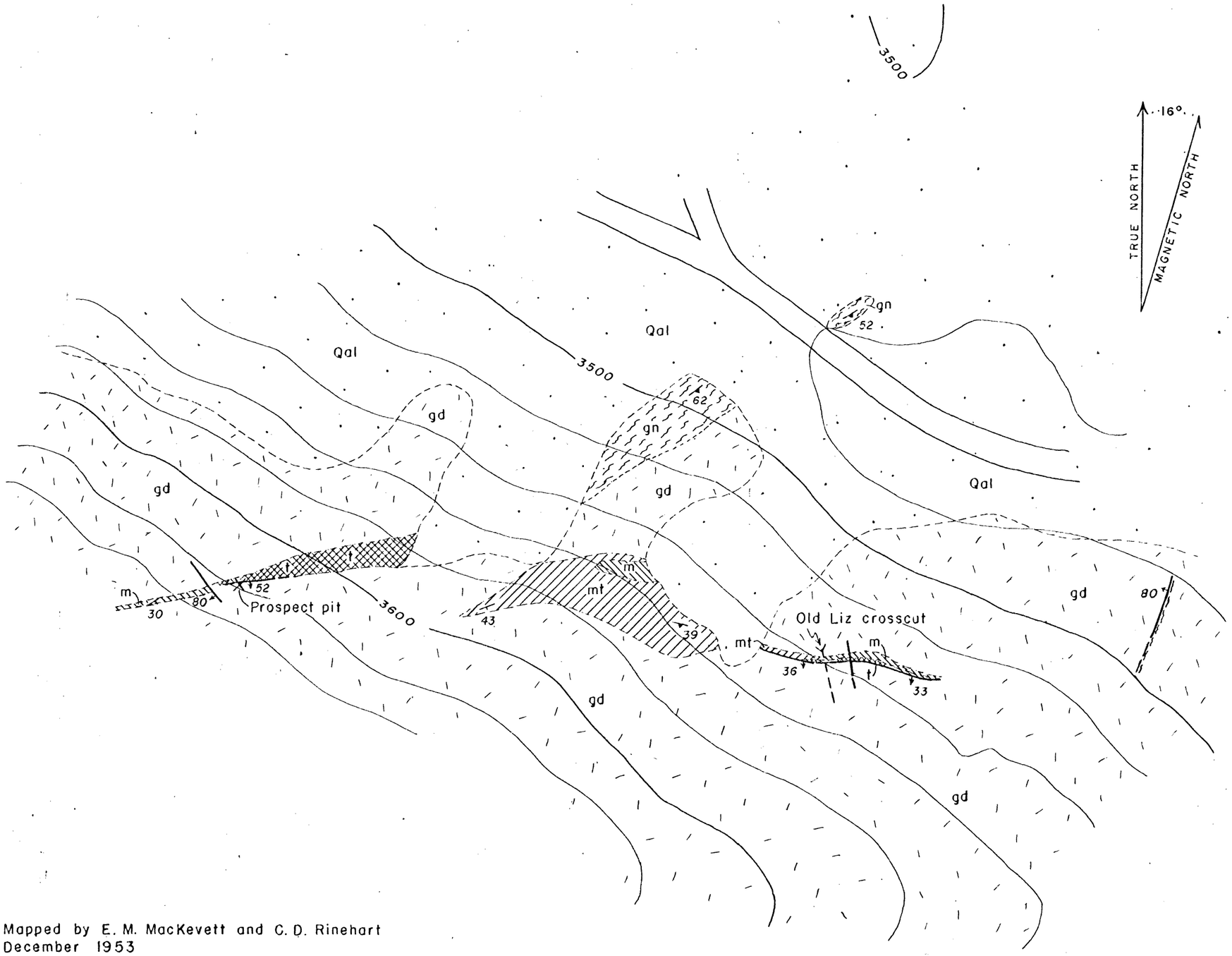
10-A
Sample locality
Showing length of sample

GEOLOGIC MAP OF THE NO. 10 WORKINGS, STARBRIGHT MINE, SAN BERNARDINO COUNTY, CALIFORNIA

Plate 2

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

DMEA 3204
(TUNGSTEN)



Mapped by E. M. MacKevett and C. D. Rinehart
December 1953

EXPLANATION

Qal — Quaternary alluvium
Includes slope wash

gd — Granodiorite

m — Marble

gn — Gneiss

mt — Mainly quartzite
Includes lessor amounts of silicated and siliceous limestone, schist, and gneiss

t — Tactite
Contains little or no scheelite

xxxxxx Scheelite-bearing tactite

Contact, approximately located

Indefinite contact

80 Fault, showing dip

Shear zone

30 Strike and dip of beds

60 Strike and dip of foliation

GEOLOGIC MAP OF OLD LIZ AREA, STARBRIGHT MINE, SAN BERNARDINO COUNTY, CALIFORNIA

50 0 50 100 150 FEET

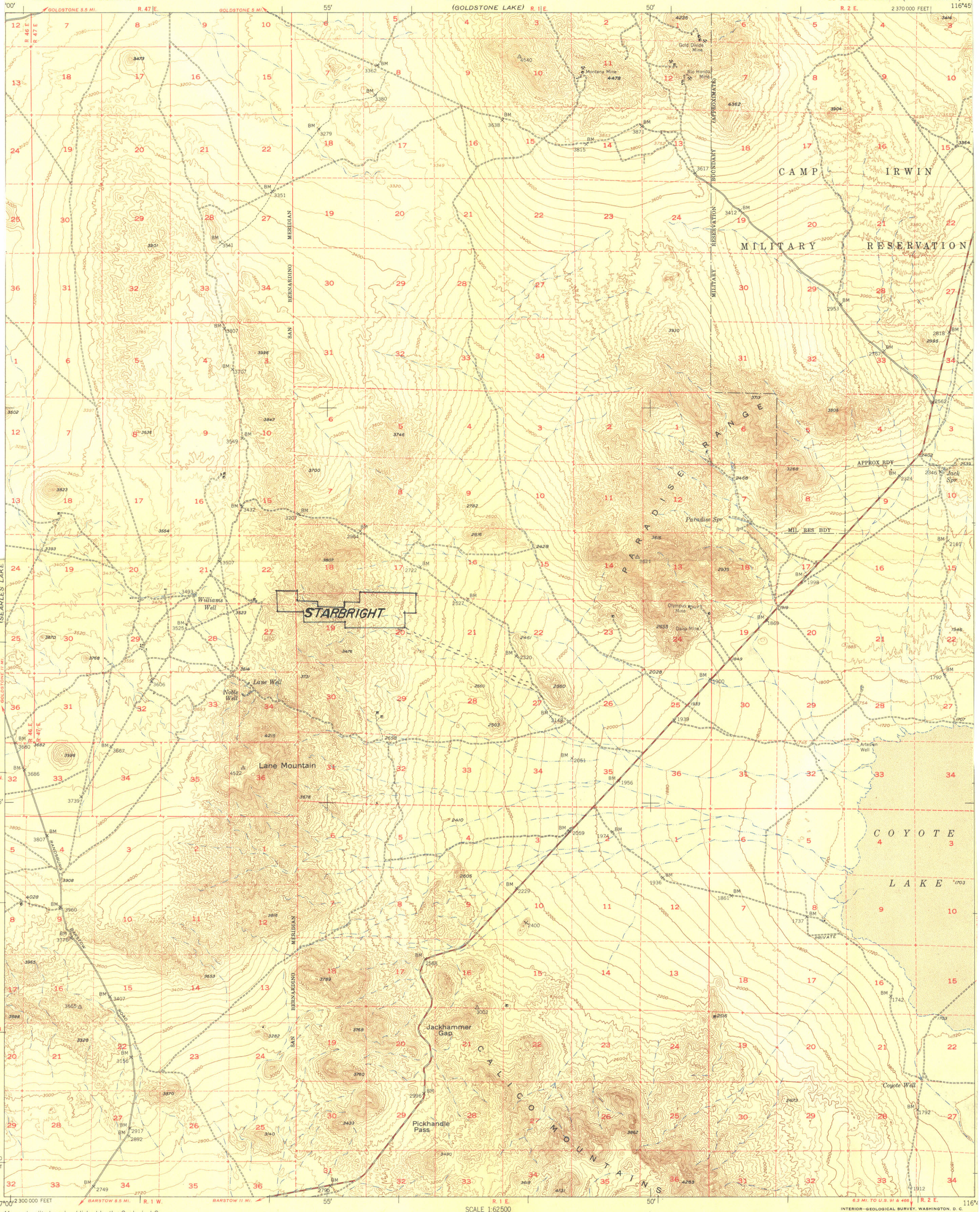
Contour interval 20 feet
Datum assumed

Plate 3

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

UNITED STATES
DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS

LANE MOUNTAIN QUADRANGLE
CALIFORNIA-SAN BERNARDINO CO.
15 MINUTE SERIES (TOPOGRAPHIC)



Mapped, edited, and published by the Geological Survey

Control by USC&GS and USGS

Topography from aerial photographs by multiplex methods
Aerial photographs taken 1948. Field check 1948

Polyconic projection. 1927 North American datum
10,000-foot grid based on California coordinate system, zone 5

Dashed land lines indicate approximate location

Unchecked elevations are shown in brown

TRUE NORTH
MAGNETIC NORTH
16°
APPROXIMATE MEAN DECLINATION, 1948

SCALE 1:62 500

1 ½ 0 1 2 3 4 MILES

3000 0 3000 6000 9000 12000 15000 18000 21000 FEET

1 .5 0 1 2 3 4 5 KILOMETERS

CONTOUR INTERVAL 40 FEET
DASHED LINES REPRESENT HALF-INTERVAL CONTOURS
DATUM IS MEAN SEA LEVEL

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS

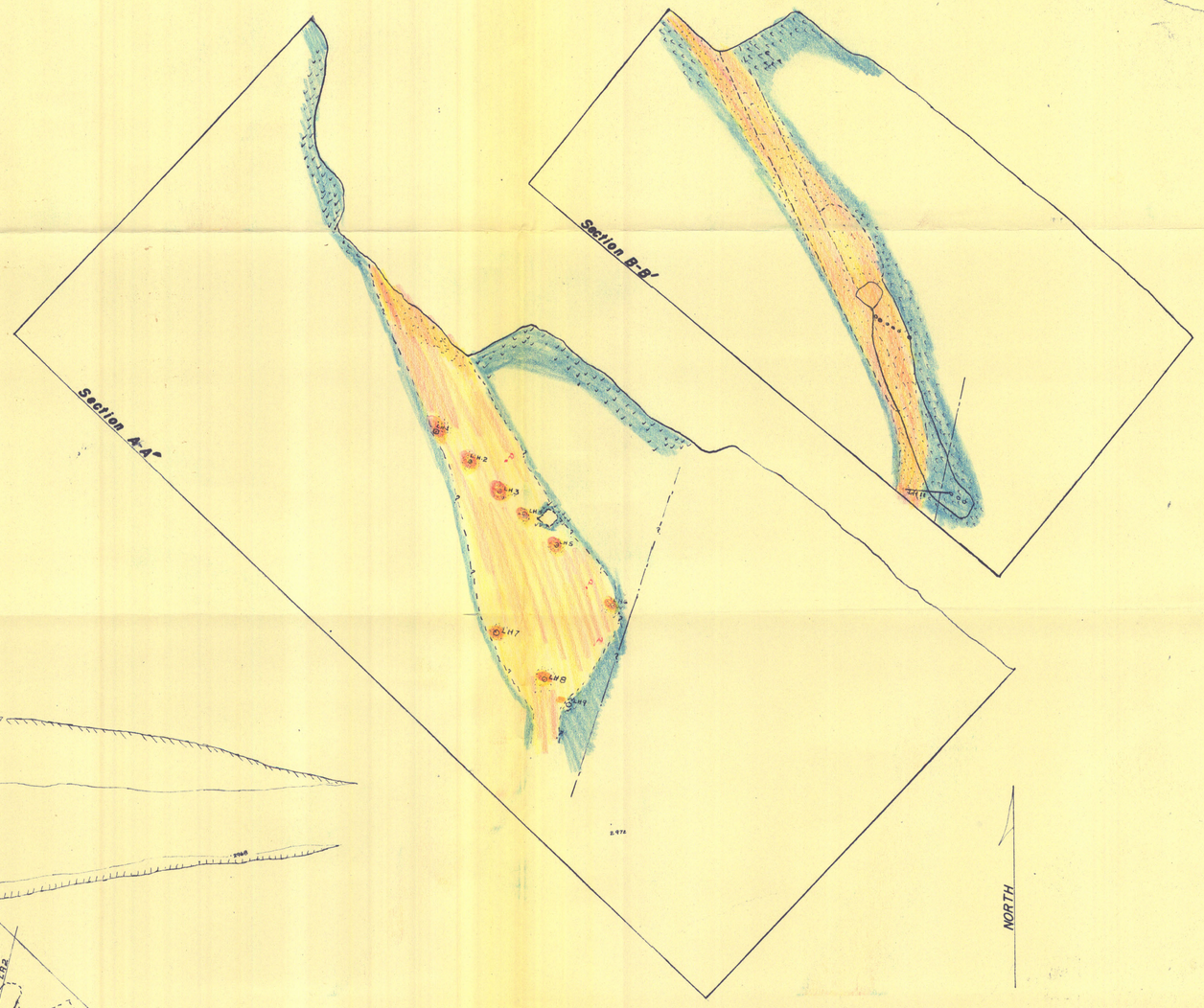
INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.

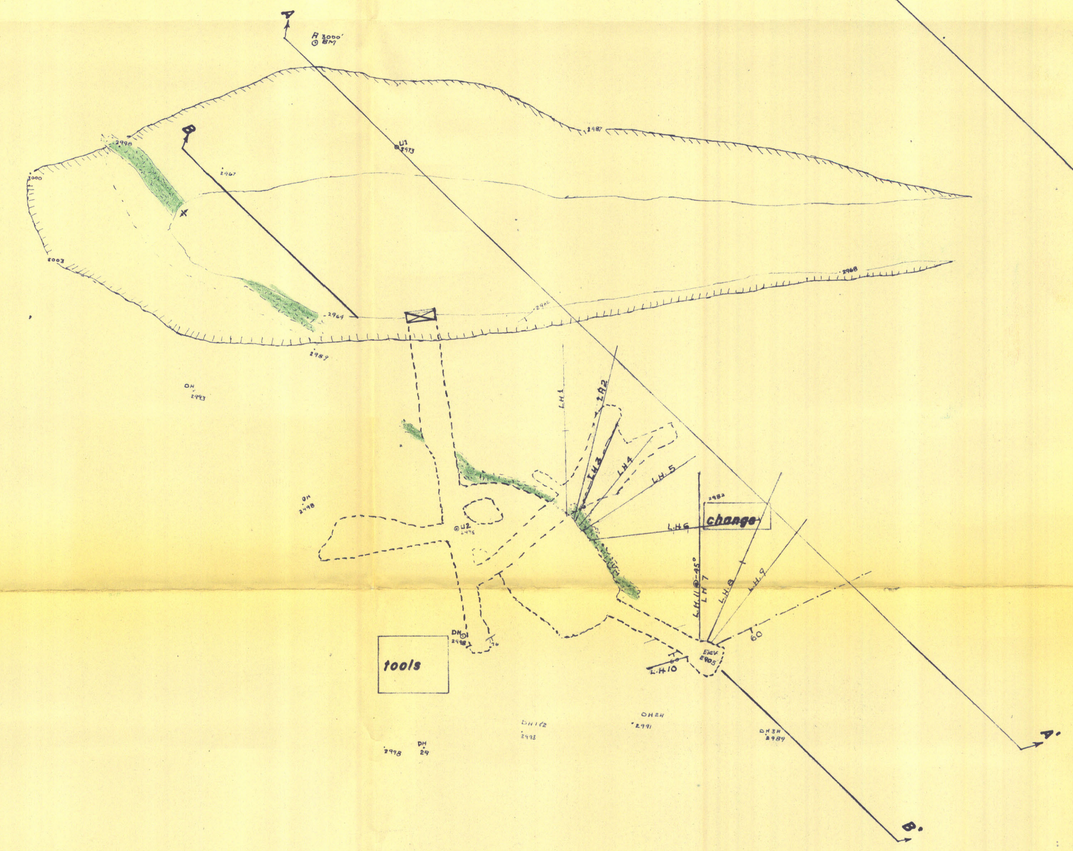
ROAD CLASSIFICATION

Heavy-duty — 4 LANE | 2 LANE
Medium-duty — 4 LANE | 2 LANE
Light-duty
Unimproved dirt
U. S. Route
State Route

LANE MOUNTAIN, CALIF.
N3500—W11645/15

EDITION OF 1951





NO. 1 PIT

of the

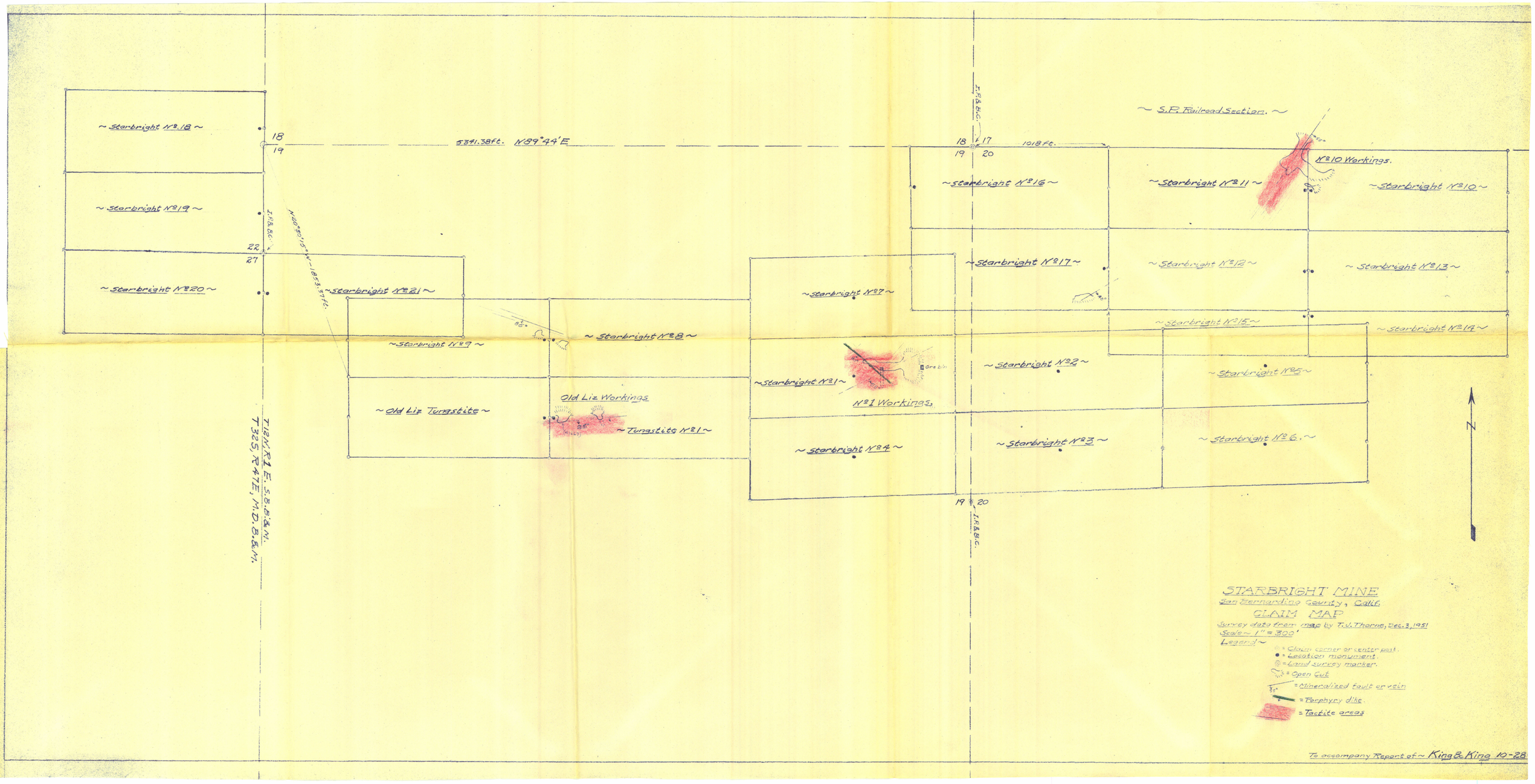
STARBRIGHT MINE

LANE MOUNTAIN QUADRANGLE, CALIFORNIA

SCALE: 1" = 20'

- Tactite-tungsten bearing
- Granite
- Dikes
- Faults
- Underground Workings
- L.H.7 — Long Holes
- 2905 — Elevations

To Accompany Report By
KING & KING October 1953

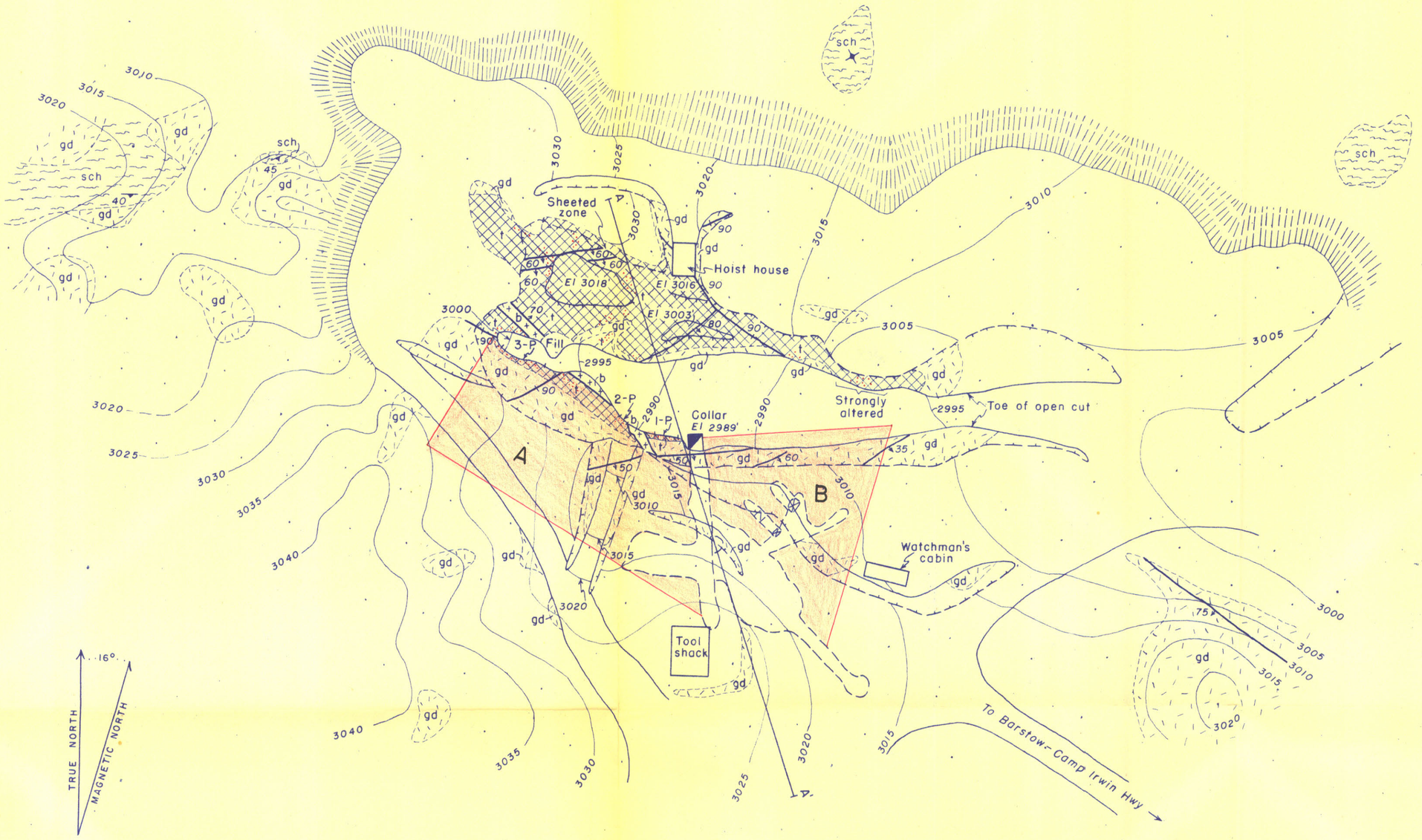


STARBRIGHT MINE
San Bernardino County, Calif.
CLAIM MAP
Survey data from map by T.U. Thorne, Dec. 3, 1951
Scale ~ 1" = 300'
Legend ~
= Claim corner or center post.
= Location monument
= Land survey marker.
= Open Cut
= Mineralized fault or vein
= Porphyry dike.
= Tactite areas

To accompany Report of ~ King & King 10-28

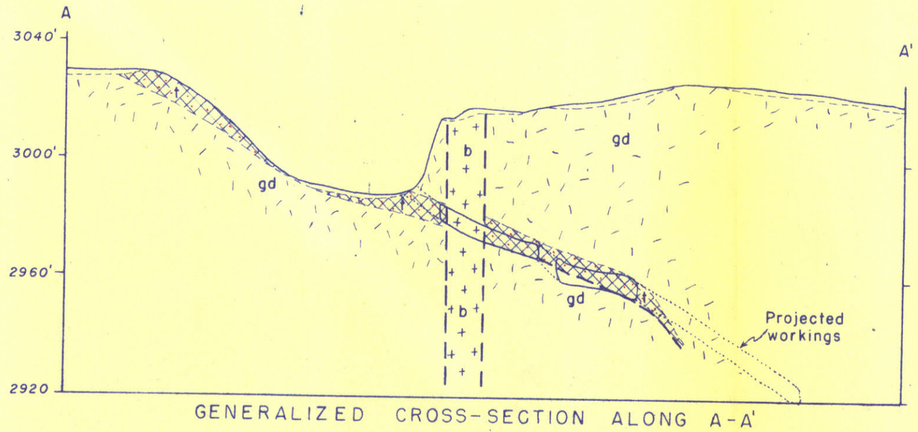
UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

DMEA 3204
(TUNGSTEN)

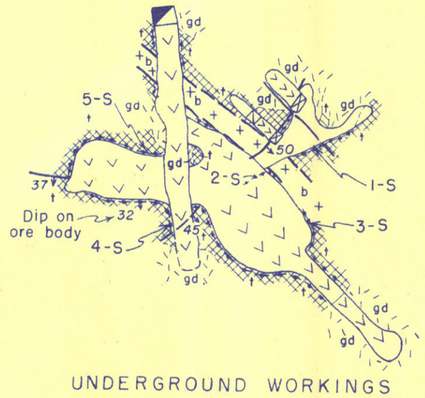


SURFACE MAP OF THE NO. 1 WORKINGS

Mapped by C.D. Rinehart and E.M. MacKevett December, 1953



GENERALIZED CROSS-SECTION ALONG A-A'



UNDERGROUND WORKINGS

EXPLANATION

al — Alluvium, slope-wash and some dump material

t — Tactite

a, b — Scheelite-bearing tactite
a-surface, b-underground

sch — Schist

gd — Granodiorite

b — Basalt

Contact
Dashed where approximately located

75 — Fault, showing dip
Dashed where approximately located

45 — Strike and dip of foliation

Horizontal foliation

Open cut

Dump

Shaft at surface

Inclined workings
Chevrons point down; 5 foot vertical distance between chevrons

Foot of raise or winze

Head of raise or winze

Underground workings

1-S, 3-P
Sample locality

A
Outline of ore reserve block, projected to surface

GEOLOGIC MAP OF THE NO. 1 AREA, STARBRIGHT MINE, SAN BERNARDINO COUNTY, CALIFORNIA

40 0 40 80 120 FEET

Contour interval 5 feet
Datum approximately sea level

PLATE 1