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3156
Tung

APR 19 1954

Mr. Rene Engel, Manager
Rene Engel and Associates
1222 Blair Avenue
South Pasadena, California

Re: Docket No. DMEA 3156 - Tungsten
Pala Tungsten Claims
Kern County, California

Dear Mr. Engel:

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

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.

Careful study of all our information indicates that although some tungsten-bearing tactite occurs on your property, the probability of disclosing minable tungsten ore reserves by your proposed exploration program is not sufficiently promising to justify Government participation. We regret to advise, therefore, that your application for exploration assistance is denied.

However, our review of the available reports suggests that mining the ore now known in the old open cut would soon demonstrate whether there is any worthwhile persistence to what appears to be the best showing in the area. If structure continuity can be demonstrated by such mining, or the possible existence of similar ore-bearing structures on your property shown, we shall be glad to consider a new application based upon an exploration program of those new target areas.

We wish to thank you for your interest in the Defense Minerals Exploration Administration program and for bringing your property to our attention.

Sincerely yours,

C. O. Mittendorf

Administrator

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

JHopkins /FEJohnson/ls 4/19/54

Mr. Rene Engel, Manager
Rene Engel and Associates
1222 Blair Avenue
South Pasadena, California

Re: Docket No. DMEA 3156 - Tungsten
Pala Tungsten Claims
Kern County, California

Dear Mr. Engel:

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

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.

Careful study of all our information indicates ~~that~~ that although ~~your proposed program is commendably well designed~~ the probability of disclosing minable ore reserves, ~~on the project prospect~~ is not sufficiently promising to justify Government participation ~~single-handed~~. We regret to advise you, ~~under these circumstances~~, that your application for exploration ~~assistance~~ is denied.

~~Our denial is made without prejudice to the property in order as production is commenced.~~ Nevertheless, our review of the available reports suggests ~~that~~ that mining the ore now known in the old open cut would soon demonstrate whether there is any worthwhile persistence to what appears to be the best ~~[illegible]~~ in the area.

We wish to thank you for your interest in the Defense Minerals Exploration Administration program and for bringing your property to our attention.

Sincerely yours,

Administrator

JHopkins:fcc
4-14-54
cc to: Docket
Code 400
Adm. Reading File
Operating Comm.
FT. Reg. III
R. W. Geehan, USBM
T. P. Thayer, USGS

April 14, 195[illegible]

MEMORANDUM

To: Administrator

From: Loan and Purchase-Allegan Division

Subject: Denial of application for exploration assistance in the amount of $20,000.00
Docket No. DMEA 3[illegible] - Tungsten
Dana Engel and Associates
Pala Tungsten Claims
Kern County, California

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

1. The applicant requested exploration assistance in the amount of $20,000.00 to explore for tungsten on the Pala Tungsten Claims, Kern County, California.

2. The Pala tungsten property is located near the south end of the Sierra Nevada mountains in a pendant of metamorphics in plutonic rocks. An alteration zone of tactite and cal-silicate rocks containing the tungsten mineral scheelite occurs in the marble near a south contact with granodiorite.

3. The mine workings consist of two drifts, 14 feet and 25 feet long, respectively; two crosscuts 75 feet and 27 feet long, respectively; one large open cut; one stope; and about 300 feet of surface cuts averaging 3 feet in width and 5 feet in depth.

4. The tungsten mineral scheelite occurs sporadically disseminated in the tactite. The tactite bands are fairly continuous along the granodiorite contact for a distance of 350 feet. The scheelite concentrations are sporadic and erratic in extent.

5. The two tactite bands overlap each other along their strike. The one developed in the open cut is shown to be 2 to 6 feet thick in the cross-cutting trenches and bulls out to a zone of mixed tactite and marble over 30 feet wide in the open cut. The other band is parallel to and 20 feet south of the first band, is 240 feet long and 1 to 5 feet thick. It appears to contain fewer and poorer concentrations of scheelite than the first band.

6. The analyses and locations of 10 samples taken during the examination from the underground and surface workings are as follows:

Sample No.	Length	% WO_3	Location
[illegible]	1.0 feet	0.45	4 feet above floor-face lower tunnel drift
522	1.6 "	1.84	2.5 " " " " " " "
523	2.0 "	0.81	3.5 " " " " " " "
524	3.5 "	0.77	4.5 " " " " " " "
525	5.5 "	0.50	east end of stope
526	1.5 "	.45	Cut 1 W
527	5.0 "	0.72	Cut 2 AW
528	2.8 "	0.36	Cut 5 W
529	1.5 "	0.29	Cut 6 AW
530	1.0 "	1.00	Cut 7 W (from both sides of cut)

7. The examining engineers estimate ore reserves as follows:

On the southern band of tactite between trench C6W and 5 feet west of C7W might be expected to contain an average of 0.5 percent WO_3. A block of scheelite-bearing tactite 5 feet wide, 48 feet long and 24 feet deep might be inferred to contain 576 tons of rock containing 288 units of WO_3.

On the northern band, assuming that geologic conditions and grades of scheelite exposed on the surface are duplicated at the level of the lower tunnel, a block of scheelite-bearing tactite is inferred 60 feet on strike by 5 feet wide by 25 feet deep, amounting to 750 tons and containing 0.57 percent or 428 units of WO_3.

The reserves are considered sub-marginal, or marginal at most, in value.

8. The past production is not known but probably included several hundred tons of scheelite-bearing ore mined from an open cut and a small stope that had a grade of between 0.5 and 0.6 percent WO_3.

9. Because the scheelite concentrations are spotty and erratic in extent, the examining engineers conclude that there is very small probability that the Government would be reimbursed for the amount of its participation in almost any program of exploration that might be considered.

10. The examiners recommend that DMEA funds for exploration of the Pala Tungsten claims be denied.

11. The Field Team concurs in the denial.

12. The Commodity Divisions of the Geological Survey and Bureau of Mines concur in the denial.

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

JHopkins/fec
4-14-54
cc to: Docket
Code 400
Adm. Reading File
Operating Comm.
Mr. Hopkins

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

April 9, 1954

Memorandum

To: W. S. Martin, DMEA

From: Robert W. Geehan

Subject: Pala Tungsten Claims - DMEA 3156
Rene Engel and Associates
Kern County, California

Applicant proposes 1,200 feet of diamond drilling which, if favorable, would be followed by underground exploration comprising 150 feet of drifting and crosscutting, and 70 feet of raising. Applicant estimated a cost of $20,000. The field team recommends the application be denied.

The diamond drilling could do no more than establish the extent of the tactite and other rock formations; tungsten mineralization at the deposit is too spotty for this method of exploration. The excellent exploration work done from the surface has not revealed a good target for underground exploration. The area below the old open cut has not been completely investigated. This area is the only portion of the deposit that would seem to have a potential for production of significant quantities of ore. The field team report does not contain a section indicating the geological structure at the bottom of the wide tactite zone. The lower tunnel contains very little tactite.

I concur with the field team conclusions that the diamond drilling phase should be denied. The only area that appears favorable for underground work has been tested, in large part, by the lower tunnel. If the applicant mines ore now known in the open-cut area any continuation of the wide tactite will be exposed. Rejection of the project should provide for another application if additional work demonstrates a target."

/s/ Robert W. Geehan

Robert W. Geehan

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

400

April 8, 1954

Memorandum

To: W. S. Martin, MEA

From: E. L. Hewcomb, MSG

Subject: Concurrence with Field Team denial
Docket MMA-3156 Pala Tungsten Claims
Greenhorn District Kern County, Calif.

The applicant proposes to explore his claims by 1200 feet of diamond drilling which, if successful, would be followed by 150 feet of drifting and crosscutting, and 70 feet of raising.

The field team recommends the application be denied.

Inferred reserves were estimated by the field team to be about 1300 tons averaging 0.5 - 0.6 percent WO_3.

The nature of the scheelite deposits as localized pods which are erratically distributed along a tactite zone indicates that significant amounts of tungsten ore are unlikely to be found by the proposed work. Drilling tactite zones containing small pods of mineralization would provide very little information and the intersection of ore would be strictly a matter of chance. The amount and grade of mineralization exposed on the property does not justify the expenditure of Government funds. Sufficient work has been done to indicate that more continuous and higher grade deposits cannot reasonably be expected at depth.

I concur with the field team examiners' conclusions and recommend the application be denied.

E. L. Hewcomb

(3) W.S. Martin

Copy retained AMC

400

file with Omea 3156

MAR 2 7 1953

Mr. Rene Engl
1222 Blair Avenue
South Pasadena, California

Dear Mr. Engl:

Your request to Mr. V. A. Brussolo of the Defense Materials Procurement Agency for information concerning exploration assistance has been referred to the Defense Minerals Exploration Administration for reply.

The United States Government grants assistance to individuals for the exploration of strategic minerals on a participating basis under the rules and regulations set forth in the attached mineral order DMEA Order-1. Certain sections of the order are explained more fully in the "Questions & Answers" booklet included herewith.

In the case of tungsten, the Government will participate to a maximum of 75 percent of the estimated exploration cost on approved projects, the money to be repaid from income on future production.

If you are interested in participating in this program, it is suggested that you complete in detail and return four of the attached copies of Form MF-103 to us. If you require advice in preparing the application, please communicate with Mr. H. C. Miller, Executive Officer, DMEA Field Team, Region III, 1012 Flood Building, 870 Market Street, San Francisco 2, California.

Sincerely yours,

C. O. Mittendorf

Administrator

Enclosures

Engles letter of July 11, 1953 rec'd July 16 and sent to Files marked: "No reply necessary" WSM

CC: Mails & Files
CODE 400
ADMN. READ. FILE
MR. V. A. BRUSSOLO, RM. 7006, GSA BLDG. - DMPA FIELD TEAM, REGION 3

WSMartin/ls
3/27/53

402

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

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

March 24, 1954

WSM

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-3156 - Tungsten
Rene Engel and Associates
Pala Tungsten Property
Kern County, California

Reference is to your letters dated October 5, 1953, and March 3, 1954, relating to a field examination of the subject property.

The examination has now been made and there are attached four copies of a report entitled "DMEA-3156, Pala Tungsten Claim Group, Kern County, California," by J. F. Robertson and H. K. Stager, Geologists, U. S. Geological Survey, and F. J. Wiebelt, Mining Engineer, U. S. Bureau of Mines, dated March 15, 1954.

The engineer and geologists recommend that the application for a loan be denied. They point out in their report that the tungsten mineral scheelite occurs sporadically disseminated in an alteration zone of tactite and calc-silicate rocks, that the scheelite concentrations are spotty and erratic, and that they do not believe that sufficient ore can be indicated to warrant an exploration loan.

I am not personally acquainted with the property and agree with the engineer and geologists that the scheelite mineralization is spotty and somewhat erratic. It must be admitted, however, that some of the spots are fairly good ore.

The information shown on the assay map makes me wonder if there isn't a possibility of an ore body somewhere along the line of excavations. I would be interested in hearing from your tungsten experts on what they think.

H. C. MILLER

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

Reviewed by
DMEA OPERATING COMMITTEE
4-2-54
(date)

Attachment

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION III

DMEA-3156, Pala Tungsten Claim Group

Kern County, California

J. F. Robertson, Geologist
H. R. Stager, Geologist
U. S. Geological Survey

F. J. Wiebelt, Mining Engineer
U. S. Bureau of Mines

March 15, 1954

Reviewed by
DMEA OPERATING COMMITTEE
4-2-54
(date)

EXAMINATION REPORT

Docket No.: DMEA-3156 (Tungsten)

Name and address of applicant: Rene Engel & Associates
1222 Blair Avenue
South Pasadena, Calif.

Name and location of property: Pala Tungsten Claim Group
Kern County, California

SUMMARY

Pursuant to an "Application for Aid in an Exploration Project" an examination of the Pala tungsten property in Kern County, Calif., was made by two geologists of the Geological Survey and an engineer of the Bureau of Mines.

The mine is three miles northwesterly of Wofford Heights, which town is four miles southwest of Kernville, Calif.

The tungsten mineral scheelite occurs sporadically disseminated in an alteration zone of tactite and cal-silicate rocks which occur in marble near a contact with granodiorite. It is estimated that the mine has 1,326 tons of approximately 0.54% WO_3 content inferred ore reserves.

Ten samples were taken from the property by the examiners.

The applicants proposed exploration plan consists of 1200 feet of diamond drill holes and if results of drilling are favorable then the drilling program will be followed by a certain amount of underground exploration work consisting of 150 feet of drifting and crosscutting and 70 feet of raising. The applicant estimates the total cost of the proposed work

at $20,000.00.

CONCLUSIONS

The trenches, open cuts, and underground workings adequately outline the extent of the deposit and assays of samples are believed to be representative. The expectable grade of the deposit explored by the proposed drilling would not materially change from that which is now exposed. Calculation of ore reserves shows that only a small tonnage of scheelite-bearing tactite can be inferred containing little better than 0.5 percent WO_3, which gives marginal to submarginal value to the deposit. The scheelite concentrations are spotty and erratic in extent and it is doubtful that this grade of deposit can be mined, let alone be explored, and show any margin of profit at the present time. There is very small probability that the Government would be reimbursed for the amount of its participation for practically any program of exploration that might be considered.

RECOMMENDATIONS

The examiners recommend that DMEA funds for exploration at the Pala Tungsten claims be denied.

INTRODUCTION

The examiners, consisting of Jacques Robertson and Harold Stager of the U. S. Geological Survey and Frank J. Wiebelt of the Bureau of Mines, spent Jan. 26 and 27, 1954 on the property. They were accompanied during the examination by Rene Engel and W. C. Goth of the company.

NAME AND LOCATION OF PROPERTY

The Pala Tungsten mine is accessible from Wofford Heights, a town four miles southwest of Kernville, Calif., by three miles of fairly well-graded dirt road known as Evans Road. The property is in Kern County, California in the eastern portion of the Greenhorn Mountain Mining District. It lies in section 25, T. 25 S., R. 32 E., M.D.B.&M. The mine is also known as the "Andrews" and the "Reagan" mine.

ACCESSIBILITY

The property is accessible throughout most of the year except in periods of heavy snowfall. The property lies close to the bottom of the snowfall line.

COMPETENCY OF APPLICANT

The applicant supplied excellent maps with the docket. The trenches and underground workings were open and in good condition for the examination and his samples appear to be accurate and reliable. His estimate of possible tonnage reserves are much too high. The applicant (Mr. Rene Engel) was very cooperative during the examination.

APPLICANT'S PROPERTY RIGHTS

The applicants, Rene Engel & Associates, have a lease on the property from the owners of "Pala Ranches" of Kernville, Calif. The property consists of six unpatented lode claims. The names of the claims and the book and page numbers of records of location notices as reported in the applicants' application follows:

Pala No. 1 or Old Andrews Tungsten,	recorded in	book	1725,	p. 306
Pala No. 2 or Andrews No. 2	"	"	" 1825,	p. 238
Pala No. 3	"	"	" 1987,	p. 3
Pala No. 4	"	"	" 1987,	p. 5
Pala No. 5	"	"	" 54983,	(1952)
Pala No. 6	"	"	" 54984,	(1952)

The above are recorded in the official records of Kern County, Calif.

DESCRIPTION OF PROPERTY

No buildings are on the property and the mine equipment consists of a 105 cu. ft. compressor with Waukesha gasoline engine and a 1-ton mine car.

Mine workings consist of two drifts, 14 feet and 25 feet long respectively; two crosscuts, 75 feet and 27 feet long, respectively; one large open cut; one stope; and about 360 feet of surface cuts averaging about 3 feet in width and 5 feet in depth. The applicant supplied excellent geologic and topographic maps with the docket. A map covering that portion of the property on which the proposed exploration work was contemplated is shown in fig. 2 which accompanies this report.

The location of 10 samples, taken during the examination, from the underground and surface workings are shown in fig. 2. The analyses and other data pertaining to these samples follows:

Sample No.	Length	%, WO_3	Location
BM-521	1.0 feet	0.45	4 feet above floor - face lower tunnel drift
BM-522	1.6 "	1.04	2.5 feet " " " " " "
BM-523	2.0 "	*0.01	3.5 feet " " " " " "
BM-524	3.5 "	0.77	4.5 feet " " " " " "
BM-525	5.5 "	0.50	east end of stope
BM-526	1.5 "	0.45	cut 1 W.
BM-527	5.0 "	0.72	cut 2 AW
BM-528	2.8 "	0.36	cut 5 W.
BM-529	1.5 "	0.29	cut 6 AW
BM-530	1.0 "	1.00	cut 7 W (from both sides of cut)

*Less than.

GEOLOGY

The Pala tungsten property is located near the south end of the Sierra Nevada in the Kernville quadrangle, Kern County, Calif., that was mapped by Miller and Webb.[1/] It is in a pendant of metamorphics in plutonic rocks 3 miles west of old Kernville near the west boundary of the quadrangle. Geology within the claims has been mapped in detail by the applicant on the scales of 1 inch equals 40 feet and 1 inch equals 10 feet; the aerial map accompanies the docket and the larger scale map of the workings is included in this report.

The geologic setting consists of a lens of blue-gray to white marble bounded by biotite schist, phyllite, and gneiss on the north and east sides and partly on the south. An alteration zone of tactite and calc-silicate rocks that contain the tungsten mineral scheelite occurs in the marble near a south contact with granodiorite. Prospect trenches and mine workings that are concentrated in this area expose the tactite and mixed rock.

1/- Miller, W. J., and Webb, R. W., 1940, Descriptive geology of the Kernville quadrangle, California: Calif. Jour. of Mines and Geology, vol. 36, p. 343-378.

In contact with the marble and meta-sediments to the northwest is a granitic phase of the Isabella granodiorite.

The contact between coarsely crystalline marble and granodiorite trends N. 80° E. and is essentially vertical, which attitude conforms to bedding in the marble. Marble near the contact has been invaded and altered to form two well-defined but narrow bands of mixed rock that include calc-silicates and scheelite-bearing tactite. Tactite that occurs as small lenses farther within the marble contains only traces of scheelite. On the accompanying map (fig. 2) the rocks are classified in detail.

Metamorphism has differentially affected the marble. Some of it is altered to a light-colored calc-silicate, locally made up of identifiable wollastonite, calcite, garnet, and epidote. Other minerals such as diopside and tremolite may be present locally. The tactite consists mainly of dark reddish-brown garnet, epidote, and green amphibole. Thin quartzitic interbeds in the marble appear to be only recrystallized but may be partly secondary. Greenish-gray bands of fine-grained slightly schistose rock, referred to as "dolerite", are either diabasic dikes or calc-silicate granulites. A medium-grained granulite containing felspar, amphibole, and pyroxene occurs between tactite and "dolerite" in the lower series of trenches. It is a hybrid rock, probably a contact phase between the calc-silicate and granodiorite. The granodiorite itself is medium-grained, equigranular, and contains feldspar, quartz, biotite, and hornblende. It is well exposed along the road to the south below the

trenches and at the portal of the lower tunnel. In the trenches is a white, fine- to medium-grained rock that the operator referred to and mapped as "pegmatite". A better field term is "aplite", although the rock may actually be related to the calc-silicates.

The few faults exposed or apparent in the area of the workings do not seem to produce significant displacement of the tactite zone or influence the distribution of scheelite. No folds were observed in the rock in the area of the workings, although they are reported by the operator to occur in the marble some distance from the workings.

SCHEELITE DEPOSITS

The tungsten mineral scheelite occurs sporadically disseminated in the tactite in crystals rarely as large as 2 millimeters. Although the tactite is fairly continuous along the granodiorite contact for a distance of 350 feet, the scheelite concentrations are spotty and erratic in extent. Except for traces in small pods of tactite in the marble, scheelite is confined to the two tactite bands exposed by the trenches and underground workings.

The two tactite bands overlap each other along their strike. The one that has been developed in the open cut can be traced for 170 feet. In the crosscutting trenches it ranges from 2 to 6 feet thick, but bells out in the open cut to a zone of mixed tactite and marble over 50 feet wide. The other band is parallel to and 20 feet south of the first band, is 240 feet long, and 1 to 5 feet thick. It appears to contain fewer and poorer concen-

trations of scheelite than the first band.

No scheelite was observed in quartz veins as suggested by the applicant. The short drift in the lower tunnel exposes 4 or 5 pods of scheelite-bearing tactite that average 2 feet thick by 4 feet long. They are located 40 to 50 feet vertically below the surface exposures in the open cut, and appear to be the down dip portion of the first band described above.

ASSAYS AND RESERVES

Inspection of the tactite band in the southern-most series of trenches with ultraviolet lamp showed none or only traces of scheelite. The applicant suggested that sluff from the trench sides and slope wash had covered the exposures, but diligent picking of the trench walls and floor uncovered no significant mineralization. Assays for WO_3 by the Ed Eisenhauer Laboratories in Los Angeles from samples taken by the applicant indicate that the scheelite is probably below commercial grade. The highest value obtained is from sample P37 in trench C7W (see fig. 2), 5.7 feet of tactite assaying 0.72 percent WO_3. The other low values from the applicant's assays along this tactite band show that the concentration of scheelite drops off steeply from this value, and the lack of showings with ultraviolet lamp suggest erratic distribution. Roughly calculated, about 48 feet along strike of this band, from trench C6W to 5 feet west of trench C7W, might be expected to contain an average of 0.5 percent WO_3. At the most, a block of scheelite-bearing tactite 5 feet wide by an estimated 24 feet deep

might be inferred that amounts to about 576 tons of rock containing 0.5 percent or 288 units of WO_3.

Although the northern or upper band of tactite gives indications of more scheelite than the southern band with the UV lamp, it also shows mostly low values with rather spotty concentrations of WO_3. Samples were taken for assay by the field team from showings in the trenches that exposed the upper band of tactite, and the values obtained by the Bureau of Mines are recorded on the accompanying map. Some of the applicant's sample assays shown on the map are given as checks against the DMEA assays, and for those locations where no samples were taken by the field team. Sample P9, which was taken by the applicant and assayed 1.45 percent WO_3, was from a small concentration of scheelite-bearing tactite one foot wide. The spot of scheelite had been removed sometime before the examination and scheelite that is left is much lower in value. Sample P9 is, therefore, not representative. However, the others are considered to be fairly reliable. The width of the band of scheelite in tactite is irregular on the surface, ranging from 1 to 5 feet. In the near-surface stope the scheelite is present in a pod of tactite 12 feet across from north to south. The samples from trenches C2AW and C1W, and from the stope and open cut, average 0.57 percent WO_3, weighted over a minimum width of 5 feet and for a length of 60 feet, ignoring sample P9.

The tactite exposed in the lower tunnel is undoubtedly the projection downward, 25 feet vertically, of the band on the surface. The weighted average of assays from DMEA samples gives a value of 0.75 percent WO_3 for a minimum width of 5 feet, but the tactite is exposed along strike for only 15 feet. Assuming that geologic conditions and grades of scheelite exposed on the surface are duplicated at the level of the lower tunnel, a block of scheelite-bearing tactite is inferred 60 feet on strike by 5 feet wide by 25 feet deep, amounting to 750 tons and containing 0.57 percent or 428 units of WO_3. Possibly, small pods of higher grade scheelite exist in this ground like that shown by sample P9, which might raise the grade. More likely such hot spots are offset by equally barren areas.

Sample BM #530 in trench C 7W appears to be another relatively rich but small spot that has little significance over the whole deposit.

PAST OPERATION

The mine was originally known as the old Andrews or Reagan tungsten mine and operated during the second World War.

The past production is not known but it is probable that several hundred tons of scheelite-bearing ore was mined from an open cut and a small stope. The grade of the ore probably was between 0.5 and 0.6 percent WO_3.

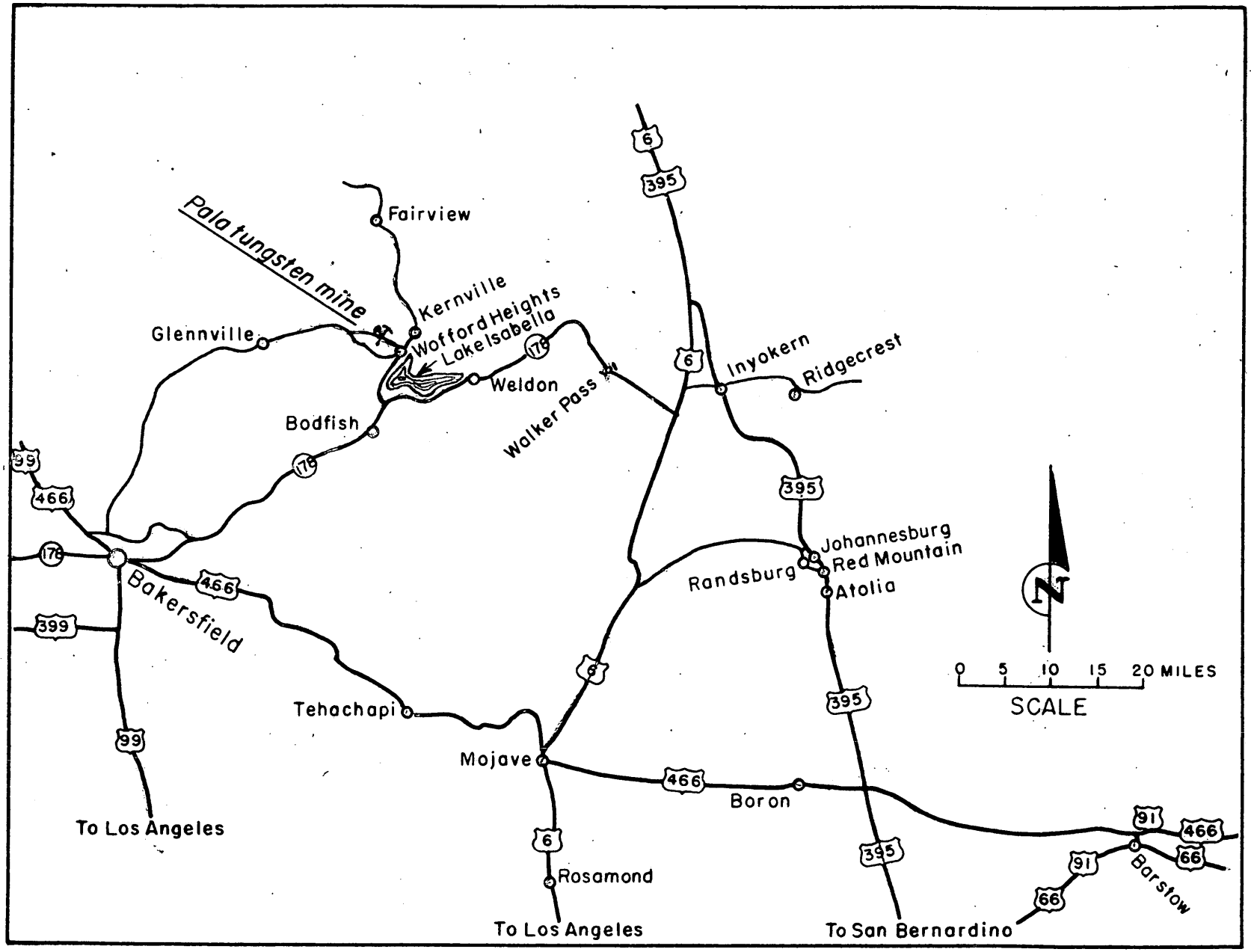
MANPOWER, SUPPLIES, ETC.

Manpower is available either in Kernville or Bodfish, about 8 miles south of Wofford Heights. Materials and supplies may be obtained in Kernville or in Bakersfield. Water may be had either from Cane Creek in the canyon below the property or Tillie Creek across the road to the west. A Southern California Edison Company power line is located about 1400 feet south of the property.

APPLICANT'S PROPOSAL

The applicant's proposal consists of 1200 feet of diamond drill holes, which if proved favorable, would be followed by underground exploration work consisting of 150 feet of drifting and crosscutting, and 70 feet of raising. The total estimated cost according to the applicant would be $20,000.00.

The examiners do not believe the above program or any other substitute program would result in sufficient returns to warrant the participation of the Government in an exploration project at the Pala tungsten claims.



Location map, Pala tungsten mine, Rene Engel & Associates, Kern County, California.
Figure 1.

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

402

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

March 12, 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-3156 - Tungsten
Rene Engel and Associates
Pala Tungsten Property
Kern County, California

Reference is made to your letter dated March 3, 1954, requesting advice as to when you may expect the field team's report and recommendations on the subject property.

Roscoe Smith advises that the geologist's contribution to a joint report was mailed to Reno on March 10. As the Reno office advises that the Bureau of Mines part of the report is being held pending receipt of the geological report, it should not be very long now before the complete report reaches my desk for transmittal to you.

H. C. MILLER

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

Copy to: Roscoe Smith, USGS

400

MAR 3 1954

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 3156 - Tungsten
Rene Engel and Associates
Pala Tungsten property
Kern County, California

Dear Mr. Miller:

The above-docketed application for exploration assistance was referred to the Field Team for review and a field examination on October 5, 1953. The Region III monthly report for January 1954 noted that a report was in preparation.

We have recently received an inquiry regarding our decision concerning the subject application. We will, therefore, appreciate being advised when we may expect the Field Team's report and recommendations.

Sincerely yours,

George C. Selfridge
Chairman, Operating Committee

APPROVED:

J. H. Hedges
Member, Bureau of Mines

D. M. Larrabee
Member, Geological Survey

Copy to: DOCKET
FT, REG. III
CODE 400
OPER. COMM.
ADM. READ. FILE
R. W. GEEHAN, USBM
T. P. THAYER, USGS

FARutledge/ls
3/3/54

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
OCT 20 1953

400

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

October 16, 1953

Mr. Rene Engel, Manager
Rene Engel and Associates
1202 Blair Avenue
South Pasadena, California

Re: Docket No. DMEA-3156 - Tungsten
Rene Engel and Associates
Pala Tungsten Property
Kern County, California

Dear Mr. Engel:

Your application for exploration assistance has been referred to this office for review and a field examination of the property.

A review of your application and the accompanying geologic map shows that you have done a good deal of careful work. Much critical information, however, is omitted. Complete assay data should be provided, along with documentation of geologic relations indicated by underground workings. In the absence of data on elevations and complete assay data there is no way of checking your estimate of "a possible tonnage of "50,000 tons of ore at 0.7 percent WO_3 or better".

The proposed diamond drilling program may be questioned. Fanning drill holes from setups on essentially vertical narrow deposits would give only a fraction of the information that would be gained by inclined holes from the hanging wall side. You apparently intend to do some blind drilling on fold apexes - a questionable procedure where so little appears to be known about exposed deposits. The size of core specified (EX) is too small for effective sampling in a deposit as spotty as the limited assay data indicate this one to be.

Kindly furnish this office with the requested missing information, and elaborate also on the theory behind the spotting of the drill holes. Upon receipt of the requested information we will give further consideration to your application and the need for a field examination.

Sincerely yours,

H. C. Miller

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

Copy to: DMEA, Washington, D. C.
E. H. Bailey, USGS

400

OCT - 5 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 3156 - Tungsten
Rene Dugel and Associates
Pala Tungsten property
Kern County, California

Dear Mr. Miller:

Reference is made to the subject application for exploration assistance, which is being referred to your office for review and a field examination of the property.

A memorandum dated September 9, 1953, by Mr. T. P. Thayer, U. S. Geological Survey, has been prepared and is enclosed for your information.

Please note Mr. Thayer's recommendation regarding the omission of critical information and the applicant's theory covering spotting of the drill holes. We suggest that you request the applicant to supply the missing information direct to your office.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee

Enclosure

APPROVED:

J. H. Hedges

Member, Bureau of Mines

A. R. Kinkel, Jr.

Member, Geological Survey

cc: Docket
FT, Reg. 3
Code 400
Oper. Committee
Adm. Read. File
R. W. Geehan, USBM
Mary Miller, USGS

JHopkins/ls
9/30/53

400

OCT 5 1953

Mr. Rene Engel, Manager
Rene Engel and Associates
1222 Mair Avenue
South Pasadena, California

Re: Docket No. DMA 3156 - Tungsten
Pala Tungsten Property
Kern County, California

Dear Mr. Engel:

Your application for assistance in exploring a tungsten occurrence on the Pala Tungsten property, Kern County, California, has been reviewed by the Iron and Ferro-Alloys Division, DMA, and has been referred to Mr. H. C. Miller, Executive Officer, DMA Field Team, Region III, 1012 Flood Building, 870 Market Street, San Francisco, California, for further consideration and a field examination.

At the time a field examination is made of the property, any assistance that you can render the examining engineers will be appreciated.

Sincerely yours,

Frank E. Johnson

ACTING Administrator

cc: Docket
Field Team, Reg. 3
Co e 400
Admr. Read. File
Mary Miller, USGS
E. W. Geehan, USBM

JHopkins/ls
9/30/53

402

SEP 21 1953

WSM

Mr. Rene Engel
Manager
Rene Engel & Associates
1222 Blair Avenue
South Pasadena, California

Re: Rene Engel & Associates
Docket No. DMEA-3156
(Tungsten)
Pala Tungsten Property
Kern County, California

Dear Mr. Engel:

Your application for an exploration contract indicates that at least 6 claims have been leased to you, and the Owner's Consent to Lien is in accord with this, as is also the map which you have submitted. However, the lease itself, which was submitted with your letter of September 9, indicates that only 4 lode mining claims were leased.

It may be that you have another lease for the 2 claims not included in the lease submitted. If that is the case, please send us a copy. If the lease which you have sent us is in error, will you please send us a corrected copy?

Sincerely yours,

Frank E. Johnson

ACTING Administrator

AEKane:ep 9-18-53

Copy to: Mails & Files
Admr. Reading File
DMEA Field Team, Reg. III (2)
Mr. Martin (2)
Mr. Hofflund
Mr. Kane
Chron.
Pending

400

SEP 3 1953

Mr. Rene Engel, Manager
Rene Engel & Associates
1222 Blair Avenue
South Pasadena, California

Re: Docket No. DMEA 3156 - Tungsten
Pala Tungsten Property
Kern County, California

Dear Mr. Engel:

This will acknowledge receipt of your letter to the Administrator, DMEA, dated August 27, 1953, enclosing four copies of your application for exploration assistance together with maps, proposal costs, and copy of Form MF-203.

We wish to call your attention to paragraph 2(d) of the application wherein you are requested to submit a copy of your lease, contract, or other document under which you control the property.

Will you therefore kindly send us a copy of your signed lease at your earliest convenience.

Sincerely yours,

SIGNED

F. A. Rutledge
Acting Chief, Iron & Ferro-Alloys Division

JHopkins:foc
9-2-53
cc: Docket
Code 400
FT. Reg. 3
Adm. Reading File
R. W. Geehan, USBM
Mary Miller, USGS

IN REPLY REFER TO:

400

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

September 9, 1953

Memorandum

To: W. S. Martin, DMEA

From: T. P. Thayer, USGS

Copy retained 400

Subject: DMEA-3156, Tungsten
Rene Engel and Associates
1222 Blair Avenue
South South Pasadena, California

The applicant proposes to drill and then drift on tactite bands in limestone on the Pala claims in Sec. 25, T. 25 S., R. 32 E., in the Greenhorn mining district, Kern County, California.

Although the Geological Survey examined the Greenhorn district in 1941, the files appear to contain no information on the deposits in question.

The geologic map shows that the applicant has done a good deal of careful work, but much critical information is omitted. Complete assay data should be provided, along with documentation of geologic relations indicated by underground workings. In the absence of data on elevations and complete assay data there is no way of checking the applicant's estimate of "a possible tonnage of 50,000 tons of ore at 0.7 percent WO_3 or better".

The proposed drilling program does not make sense. Framing drill holes from setups on essentially vertical narrow deposits would give only a fraction of the information that would be gained by inclined holes from the hanging wall side. The applicant apparently intends to do some blind drilling on fold apexes - a questionable procedure where so little appears to be known about exposed deposits. The size of core specified (EX) is too small for effective sampling in a deposit as spotty as the limited assay data indicate this one to be.

Recommendations:

The applicant should be requested to provide the missing information above, and elaborate on the theory behind spotting of the drill holes.

With complete information, if the project seems worthy, it will be necessary to refer the application to the field.

T. P. Thayer, Geologist

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 Exploration
RECEIVED
SEP 1 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-3156
Metal or Mineral
Date Received 9/1/53
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: Rene Hagel & Associates
1222 Main Avenue
South Pasadena, 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
This claim group consists of 6 lode mining claims situated in the Greenhorn mining district, Kern Co. California, in Section 25, T. 25 S., R. 32 E. M.D.B.&M. (see attached list of individual claims)

(*b*) State any mine name by which the property is known. Pale Dungeon (old names: Andrew, Keegan

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

(*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. (Form MF-203 attached herewith)

(*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 list of claims)

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.

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

(*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.

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

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

5. *The exploration project.*—(*a*) [redacted]e the mineral or minerals for which you wi[redacted] 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.

(*c*) The work will start within 30 days and be completed within seven 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.

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.).

(*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.

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

(*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.

(*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.

(*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.

(*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.

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

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 [x] Other : Services

Explain in detail on acompanying paper.

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 August 25, 1953

Reno Engel & Associates
(Applicant)

By Reno Engel

Manager

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

licant: Rene Engel & Associates,
1222 Blair Avenue,
South Pasadena, California.

3-(a) & (f) List of unpatented lode mining claims of Pala Tungsten Claim Group.

Name:	Kern County Official Records:
Pala #1 or Old Andrews Tungsten	Book 1725, page 306
Pala #2 or Andrews No. 2	Book 1825, page 238
Pala #3	Book 1987, page 3
Pala #4	Book 1987, page 5
Pala #5	Document 54983, year 1952
Pala #6	Document 54984, year 1952
Pala Claim Group, Proof of Annual Labor	Document 35514, year 1953

4-Physical Description.

(a) Piecing-up together verbal accounts and a few facts seem to establish that the Pala #1 and #2 claims were originally located under the names "Andrew Mine" or "Old Andrews Tungsten Mine" and "Andrews No. 2" respectively, by a prospector now deceased, by the name of Andrews. Initial underground development was by a small adit located above and east of station 6 (see attached maps). During the Second World War, scheelite bearing ore was mined by means of an open-cut and a small stope on the west side of the quarry floor which are still visible to-day. No production records could be located, but it is estimated that about 500 tons of ore containing around 0.7% WO_3 were probably shipped.

Followed a period of abandonment, then relocation in 1947 and 1950 by Earl V. Pascoe, one of the present owners. Several annual labor performances resulted in a total of 75 ft. of cross-cutting and 10 ft. of drifting being made on the level off station 2 (see map).

Last June, 15 ft. of drift were added by the applicant on that same level. Mine workings are readily accessible for inspection.

On September 30, 1952, the applicant obtained from the owners a 10-20 year lease on the Pala Claim Group and started geological mapping and sampling of outcrops. On June 15, 1953, a total of 360 feet of trenches averaging a width of 4 ft. and a depth of 6 ft. had been cut across the tactite outcrops and 51 channel samples had been taken and analysed for tungsten.

(b) As stated above, the past production is unknown and there is no current production.

Ore reserves are unknown because of insufficient development work. An estimate based on surface and underground mapping and sampling furnishes a possible tonnage of 50,000 tons of ore at 0.7% WO_3 or better, between the surface and the level of the lower tunnel (station 3=3765 ft.).

(c) The ore consists of scheelite contained either in tactite (epidote-garnet rock) or in quartz (veins associated with pegmatite or replacements in limestone) distributed along contacts between calcareous meta-sediments (marble and schists) and intrusives ranging from an early diorite to a later granodiorite and pegmatite. After considering for examination several strategic mineral prospects and subsequently examining several tungstem properties, the applicant selected the Pala prospect as deserving a geological study to ascertain whether or not exploration work was justified. The attached map at a scale of 1 inch=200 ft. resulted from a plane table survey conducted in the Fall of 1952. Later, the geological map at the scale 1 inch=40 ft. was made necessary to show the essential details revealed by the study of outcrops and their sampling. Assay values expressed in WO_3 % and thickness sampled are given on the detailed map.

(d) Access to the Pala property is assured by 3 miles of well graded dirt road: Evans road, running northwest from Wofford Heights on State Highway 178 between Isabella Dam and New Kernville. Living quarters and shopping facilities are available at Wofford Heights and New Kernville, 4 miles north of the former on Highway 178. Nearest railway shipping points are: Bakersfield (52.5 miles from the Pala property) and Inyokern (60.2 miles).

Applicant: Rene Engel & Associates,
1222 Blair Avenue,
South Pasadena, California.

4-Physical Description. (Cont.)

(e) Adequate manpower is available either in New Kernville or Bodfish, about 8 miles south of Wofford Heights. Current materials and supplies may be secured either in New Kernville or in Bakersfield. A stage runs daily from Kernville to Bakersfield and back. Water is available either from Cane Creek in the canyon below the property, or from Tillie Creek across the road to the west. Power is obtained at the present time by means of a gasoline engine (VIK Wankesha) connected to a compressor (I.R. 105 cu.ft.-2 stage air cooled) and a Warsop gasoline drill, all of which belong to the applicant. A Southern California Edison Company power line is located about 1400 feet south of the property.

5-The Exploration Project.

(b) The proposed plan is to establish at first the vertical and horisontal extent of the deposit by means of diamond drill borings located either on some of the largest scheelite-bearing tactite outcrops or on apices of folds marked by the thin bedded sandstone forming colored bands of quartzite in the marble body. In several instances, tactite bodies are located at or near these apices (see map), consequently in cases where no tactite outcrop is present, the occurrence of a fold apex may lead to a subjacent non-exposed tactite body when explored by drilling.

Depending upon the results obtained by drilling, a certain amount of underground exploration may then be made by drifting, cross-cutting and raising on and from the present level (station 2).

All drill cores and sludge are to be systematically collected, examined and described, sampled and analysed for tungsten as the work progresses. Similarly, all faces opened-up by underground work are to be measured, geologically sketched and described, then channel sampled and assayed. These observations are to be correlated by mapping and preparing cross sections.

On the attached geological map at the scale of 1"=40 ft. the location of the proposed exploration work is shown by blue circles, numbered from 1 to 6, for diamond drill holes and dashed blue lines for underground workings. From one drill location several borings may be made, one vertical and several slanting depending upon results obtained in each case.

(d) Biography of Rene Engel, Applicant and Manager of exploration project. Degrees: Ph.D. in Geology (major) and Chemistry (minor), California Institute of Technology, 1933: M.S. in Mineralogy and Economic Geology, University of Paris, 1912: Chemical Engineer, University of Paris, 1909: Registered Assayer, Mint, Paris, 1909.

From:	To:	
10-1952	date	Manager, Pala Tungsten Research Project, Kernville, California.
9 -1948	7 -1952	Economic Geology Investigations in Cuba.
10-1946	6 -1950	Curator of Mineralogy and Petrology, Los Angeles County Museum, Los Angeles.
1 -1946	date	Consulting Geologist and Engineer, Pasadena, California.
2 -1945	8 -1945	Volunteer worker USAFFE (CIC&G2) and Am.Red Cross on civilian relief.
1 -1942	2 -1945	Civilian prisoner of war, Santo Tomas Int. Camp, Manila. Chairman and Instructor, Education Department.
6 -1940	1 -1942	Consulting Engineer, Marsman and Company, Manila: development of mineral and chemical industries in the P.I. and Orient.
1 -1935	6 -1940	Consulting Geologist and Engineer, Pasadena and San Francisco; Examination, prospecting and development for various principals on: Tungsten and Molybdenum: Adelanto, Atolia, Laurel Creek, California, and Rawhide, Nevada. Gold-Silver (lodes and placers): Alleghany, Argus Mts. Belden, Callahan (including magnetometric survey), Downieville, Julian, Mammoth Lake, Randsburg, Perris, California; Goldsfield, Rawhide, Tonopah and Divide, Nevada.

Applicant: Rene Engel & Associates,
1222 Blair Avenue,
South Pasadena, California.

5-(d) Biography of Rene Engel (Cont.)

From:	To:	
1 -1935	6 -1940	Salines: Trona, Calif. Clays: So. Calif. for Gladding McBean & Company, Los Angeles. Soil corrosion survey for pipe line project, Consolidated Copper Mines Corp.,Kinberly, Nevada.
1 -1926	1 -1935	Instructor in charge of Mineralogy, Petrology and Geochemistry, California Institute of Technology, Pasadena, California.
9 -1925	1 -1926	Graduate research in Geology, Stanford University,Palo Alto, California.
9 -1924	9 -1925	Assistant Professor of Geology and Mineralogy, New Mexico School of Mines, Socorro, N.M.
9 -1923	9 -1924	Professor of Geology and Mineralogy, Oklahoma School of Mines, Wilburton, Oklahoma.
11-1922	9 -1923	Engineer, Geological and Engineering Dept., A.C.M.Co., Butte,Mont.
5 -1921	11-1922	Shift boss in charge of underground diamond drilling, Mine Fire and Hydraulic Filling Dept.,A.C.M.Co.,Butte, Montana.
1 -1920	5 -1921	Draftsman,Mechanical Dept.A.C.M.Co.,Anaconda and Butte.
12-1918	9 -1919	Geologist and Inspector. Saar Coal Mines; member of Saar boundary commission, Saarbrucken, Germany.
6 -1917	12-1918	Member Scientific Commission, U.S. and Fixed Nitrogen Commission, England.
9 -1914	6 -1917	Chemical Engineer, Ordance Dept.Chemical Warfare Division.
9 -1913	9 -1914	Draftsman, Mechanical Dept.,A.C.M.Co.,Anaconda, Mont.
2 -1913	9 -1913	Assistant Testing Engineer,Testing Dept.,Anaconda Copper Mg.Co., Anaconda,Montana.
9 -1912	2 -1913	Assistant Superintendent, Rio Dolores Mining Co., Rico, Colorado.

Professional Affiliation:
American Institute of Mining and Metallurgical Engineers; Geological Society of America; Mineralogical Society of America; Sigma Xi.

Biography of William C. Goth, Supervising Resident Geologist. Degrees: A.A.General Science,Los Angeles City College, 1949; B.A. Geology, University of California at Los Angeles, 1951.

From:	To:	
10-1952	date	Geologist, Pala tungsten research project.
9 -1951	1 -1953	Graduate student, U.C.L.A. Twenty-six units of graduate work completed including seminars in Econ.Geol.; Dynamic Geol.; Geomorphology & Field Investigations in which field trips were taken to several California mines: Lead-Zinc. Anaconda Copper Mining Co.-Darwin; Quicksilver-New Idria; Gold-Idaho, Maryland Mining Co., Grass Valley.
8 -1951	8 -1951	Geologist, Stratigraphic studies Elk Hills as Lt.J.G.,U.S.N.R.,T.C. Tupman, California.
10-1951	12-1951	Clerical-IBM Operator, Federal Reserve Bank, Los Angeles, California.
9 -1951	6 -1952	Reader, correct student papers, U.C.L.A.
1947-1948-1949		Driver-mechanic, U.S.Postoffice-Christmas rush.
9 -1949	8 -1951	Student, U.C.L.A.,Geology.
9 -1947	6 -1949	Student, L.A.C.C.,Los Angeles, General Science courses in Geology, Engineering, Surveying, Physics and Chemistry.
12-1946	4 -1947	Third Officer, U.S.A.T.S.,San Francisco, California.
5 -1946	9 -1946	Third Officer, Lykes Bros.,S.S.Co.,New York, N.Y.
4 -1944	4 -1946	Cadet-Midshipman,U.S.Merchant Marine Acad.Kings Pt., New York

Applicant: Rene Engel & Associates,
1222 Blair Avenue,
South Pasadena, California.

6-Estimate of Costs.

(a) Independent Contracts.

Diamond Drilling (Size EX) 6 drill locations.		
1200 ft. at $5.00 per foot		$6,000.00
Underground work (labor only)		
150 ft. Drifting and Crosscutting at $12.00 per foot	$1,800.00	
70 ft. Raising at $10.00 per foot	700.00	2,500.00
Total		$8,500.00

(b) Supervision

1 Manager and consulting engineer (R. Engel) (half time basis) (per month)	300.00	
1 Supervising resident geologist (W.C. Goth) (full time) (per month)	325.00	
	625.00	
Payroll Ded.	61.83	
	$563.17x	
	Six months	$3,379.02

(c) Operating Materials and Supplies.

Explosives - 500 lb. 40% gel. dynamite at $24.72/%	123.60	
Explosives - 800 ft. black fuse at $2.06/%	16.48	
Explosives - 300 blasting caps at $3.09/%	9.27	$149.35
Gasoline and Oil:		
Compressor: 400 gals. gaso. at $0.25/gal.	100.00	
15 gals. motor oil at $1.00/gal.	15.00	
10 gals. compressor oil at $0.84/gal.	8.40	
Jeep: 250 gals. gaso. at $0.25/gal.	62.50	
3 oil changes, greasing and servicing at $7.50	22.50	$208.40
Timber - 5000 bd.ft. at $80.00/%		400.00
Rails - 300 ft. - 20 lb./yard at $10.00/100 lbs. + spikes and fish plates (total 2150 lbs.)		215.00
Galvanized steel pipe-		
200 ft. 3/4" diam. (water line) at $0.16/foot + fittings (25%)	40.00	
200 ft. 1 1/2" diam. (air line) at $0.40/foot + fittings (25)	100.00	140.00
		$1,112.75

(d) Operating Equipment.

1. To be purchased:		
1 Drifter with cradle bar (2nd hand)	450.00	
1 Slusher (2nd hand)	500.00	
1 Air driven fan (2nd hand)	300.00	
100 ft. canvas air duct at $1.00 per foot	100.00	
2 sets drill steel 3 pcs. each at $70.15 carboloy insert chisel bits-(new)	140.30	
1 U.V. sorting lamp (new)	170.00	
1 Motor generator, 110V 60 cycles for above (new)	200.00	$1,860.30

6-Estimate of Costs. (Cont.)

(d) Operating Equipment. (Cont.)

2. Owned by applicant, use-allowance estimate:

1 Compressor (I.R. 105 cu.ft.) with Waukesha gasoline engine		
1 Mine car, 1 ton (Matteson Hendy 18 ga.)		
1 Warsop gasoline drill, with steel and tools		
Miscellaneous tools and equipment At $50.00 per month x 6	$300.00	
Engineering Equipment:		
1 Gurley transit and tripod		
1 Burger alidade, plane table and stadia board		
1Paulin altimeter		
2 U.V. portable lamps with batteries		
Drafting equipment, etc. At $25.00 per month x 6	150.00	$450.00

3. Rented

1 Jeep 1949 model at $100.00 per month x 6		600.00
Total Operating Equipment		$2,910.30

(e) Rehabilitation and repairs: None

(f) New buildings.

1. Sorting shed over ore bin, to be completed:		
500 sq.ft. corrugated steel at $0.15/sq.ft.	75.00	
Carpenter - 1 day	28.00	$103.00
2. Warehouse and Shop (20'x12'x10')		
2000 bd.ft. lumber at $75.00 (already available at mine)	150.00	
1100 sq.ft. corrugated steel at $0.15/sq.ft.	165.00	
Doors and Windoes	85.00	
Carpenter - 3 days - at $28.00/day	84.00	$484.00

(g) Miscellaneous

Assaying - 150 assays at $3.00	450.00	
Office supplies, stationery, etc. at $15.00/month x 6	90.00	
Accounting		
1 Accountant (part time) at $100.00/month		
Payroll deduction 2.50		
$97.50 x 6	585.00	
Insurance (for 6 months)		
Workmen's Compensation and Employers liability	505.00	
Liability Insurance	5.05	
Fire and Theft	22.75	$532.80
Payroll Taxes:		
Deductions	385.98	
Paid by Employer	107.28	493.26
Rental of Office and Management's living quarters $70.00/month x 6	420.00	
Living expenses and meals at $125.00/Mo. x 6	750.00	1,170.00
Total		$3,321.06

Applic[illegible]: Rene Engel & Associates,
1222 Blair Avenue,
South Pasadena, California.

6-Estimate of Costs. (Cont.)

(h) Contingencies		$189.97
Total Estimate of Costs.		
a. Independent Contracts	$8,500.00	
b. Supervision	3,379.02	
c. Operating materials and supplies	1,112.75	
d. Operating equipment	2,910.30	
e. Repairs	None	
f. New buildings	587.00	
g. Miscellaneous	3,321.06	
h. Contingencies	189.87	$20,000.00

7-(b) Applicant's share of costs:

Services: Managing and consulting (R.Engel)	$1,800.00
Use of Equipment:	$1,050.00
Money:	$2,150.00
Total	$5,000.00

MF-203

OWNER'S CONSENT TO LIEN

WHEREAS, the undersigned, as owner, ~~co-owner~~ and, lessor, ~~or seller~~ has an interest in certain property in the State of California, County of Kern, described as follows:1/ 6 unpatented lode claims, as follows:

Lode No.1 or Old Andrews Tungsten, recorded in book 1725, p.306,
Lode No.2 or Andrews #2 " " 1825, p.238,
Lode No.3 " " 1987, p.3,
Lode No.4 " " 1987, p.5,
Lode No.5 " " 54983, (1952)
Lode No.6 " " 54984, (")

of the official records of Kern Co.

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

2/ [illegible]

hereinafter called the "Operator"; and

WHEREAS, under certain provisions of said contract which are set forth on the reverse side hereof, the Government is entitled to a percentage royalty on production and to certain other rights and equities which do or may conflict with or be adverse to the interest of the undersigned in said property;

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

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

2. To secure the payment to the Government of the percentage royalty on production3/ provided for under the terms of said exploration project contract, or any amendment thereof which does not increase the maximum amount of the Government's claim here stated or alter the provisions for repayment, there is hereby granted to the Government a lien upon the land herein described and upon any production of minerals therefrom, until the royalty claim is fully paid in the amount of the Government's contribution, not in excess of 4/$ 15,000.00, or ten years have elapsed from the date of the contract.

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

Dated this [illegible] day of July, 195 3.

[illegible], Bakersfield, California [Seal]

By Earl V. Pascoe [Seal]

Paul W. Caynes [Seal]

1/ Either (a) insert the legal description of the land, or (b) strike out the words "as follows" and insert "in a lease [or contract, deed, or other document] dated _____, and recorded in book _____ page _____ official records of said county." If (b) is used, the book and page of recordation cannot be dispensed with. If the space provided is insufficient, use an Annex, and refer to the Annex in the space.

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

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

4/ Insert the maximum amount of the Government's contribution.

RELEVANT CONTRACT PROVISIONS

Repayment by Operator. (a) If, at any time, the Government considers that a discovery or a development from which production may be made has resulted from the exploration work, the Government, at any time not later than six months after the Operator has rendered the required final report and final account, may so certify in writing to the Operator. The certification shall describe broadly or indicate the nature of the discovery or development. In the event of such certification, any minerals mined or produced from the land described in Article 2 within 10 years from the date of this contract, including any mined or produced before the certification, shall be subject to a percentage royalty which the Operator or his successor in interest shall pay to the Government, upon the net smelter returns, the net concentrator returns, or other net amounts realized from the sale or other disposition of any such production, in whatever form disposed of, including ore, concentrates, or metal, until the total amount contributed by the Government, without interest, is fully repaid, or said 10 years have elapsed, whichever occurs first, as follows:

(1) One and one-half (1½) per cent of any such net amounts not in excess of eight dollars ($8.00) per ton.

(2) One and one-half (1½) per cent of any such net amounts, plus one-half (½) per cent such net amounts for each additional full fifty cents ($0.50) by which such net amounts exceed eight dollars ($8.00) per ton, but not in excess of five (5) per cent of such net amounts.

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

(b) As here used, "net smelter returns", "net concentrator returns", and "other net amounts realized from the sale or other disposition", mean gross revenue from sales; or if not sold, the market value, the market value of the material after it is mined in the form in which and the place where it is held. In the case of integrated operations in which the material is not disposed of as such, these terms mean what is or would be gross income from mining operations for percentage depletion purposes in income tax determination.

(c) To secure the payment of its percentage royalty, the Government shall have and is hereby granted a lien upon the land described in Article 2 and upon any production of minerals therefrom, until the royalty claim is extinguished by lapse of time or is fully paid.

(d) This article is not to be construed as imposing any obligation on the Operator or the Operator's successor in interest to engage in any mining or production operations.

Title to and disposition of property. All facilities, buildings, fixtures, equipment, or other items costing more than $50.00 each, paid for or purchased with funds contributed jointly by the Operator and the Government, although title may be taken in the name of the Operator, shall belong to the Operator and the Government jointly, in proportion to their respective contributions, and upon the completion of the work or the termination of the contract shall be disposed of promptly by the Operator for the joint account of the Government and the Operator, either by return to the vendor, by sale to others, or purchase by the Operator at a price at least as high as could otherwise be obtained, as may appear to be for the best interest of the Government, unless the Government, in writing, waives its interest in any such item. If necessary to accomplish such disposition, the Operator shall dismantle, sever from the land, and remove any such item, the cost thereof to be for the joint account of the parties in proportion to their respective interests. If the Operator, within 90 days after the receipt of written notice from the Government, fails, neglects, or refuses to dispose of such property, the Government may itself enter upon the land, take possession of, and remove and dispose of any such property as above provided.

DMA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
2/8	C	225

file: MC9-3156

February 7, 1957

Mr. Herbert H. Lee
P.O. Box 935
Weldon, Kern County, California

Dear Herbert:

So far as we can determine from our inquiries here, Small Business Administration has decentralized its operations to such an extent that your application should be made directly to Mr. Donald McIarnan, Regional Director, Small Business Administration, Room 412, Western Pacific Building, 1031 South Broadway, Los Angeles 15, California.

It is our understanding that approval of such loans depends on the applicant's available collateral and on the estimated future earnings of his project, with the chief emphasis on the estimated earnings. As we were also informed, the applicant must state that at least two banks have refused to advance funds for his purpose, because the Small Business Administration is not in competition with the Nation's banks. In fact, that Administration prefers to assist projects in which some bank is willing to participate to the extent of 25 to 40 percent.

It was very nice to hear from you again after a lapse of so many years. With kindest personal regards and best wishes in your mining activities,

Sincerely,

s/ Mitt

C. O. Mittendorf
Administrator

COMittendorf/fw
2/7/57

Admr.Reading File
Mr. Mittendorf

R.C.S.

8623

Weldon, Kern County,
California.

January 29, 1957.

file: DMEA-3156

Mr.C.O. Mittendorf, Administrator
United States Department ofthe Interior
Defence Minerals Exploration Administration,
Washington 25, D.C.

Dear Clarence:

Long time no see, in fact not since our last visit back in the early 1930's at Auburn, California, although I have known that you were at Washington D.C. for a long time and very happy to hear that you have such a fine position.

Occasionally I pass through Randsburg and see a few of the old timers,but not many of them left. About a year ago our old friend Mr. Fox called on me at Mojave, where I was resident engineer for a Uranium Mining Company, and I must say that he looked very sharp for an old man.

Since the last time we saw each other I have put most of my time here in the Western States engineering and supervising mining operations. In 1953 and 1954 I was in Malaya for a British iron mining company, known as Eastern Mining and Metal Co., and since have reopened the Ruth mine and mill near Trona, then the Uranium property near Mojave, and now general superintendent of mining and milling here on the Kern River for Tungsten Mining Co. , known as Rene Engel and Associates, so briefly this brings me up to date.

In checking through the file in our office, I found three letters from the DMEA, one from Mr H. C. Miller of San Francisco an two from you at Washington D. C. to Dr. Rene Engel of South Pasadena, California, dated March 27, 1953 and April 19,1954, for Government participation for exploration assistance at the Pala Tungsten Claims, Kern County, California and assistance was denied.

RE: Docket No. DMEA 3156- Tungsten.
Pala Tungsten Claims.
Kern County, California.

Since that time, Dr. Rene Engel has done more development work on the Pala Claims and has a block of commercial ore ready for stoping. Also Dr.Engel has acquired two more Tungsten properties, Near his 50 ton mill, one known as the B and F and the other as LastChance.

The B and F is opened with a 120' tunnel with Commercial ore ready for stoping.

The Last Chance Has three shafts - 20' -75' - and 100' deep all in commercial Tungsten ore.

The mill has recently been completedand we have milled about 210 tons of ore from the Pala and B and F to take the bugs out of the mill and was able to make a 72% recovery of WO3. He now has a small stockpile of WO_3 concentrates, but

as you know, the Governmentis not purchasing Tungsten Concentrates at this time.

The Company has exhausted their working capital and at present closed down. Dr. Engel has informed me that he wants to try to acquire a Government-Small Business Admimistration loan of $30,000.00 for three years, in order to carry on production and development work. Apparently there is much more commercial ore in sight than necessary to pay back the loan.

I told Dr. Engel That I would write to you asking for any information that you would be willing to give on the Small Business Administration Loan. SoClarence, a reply will be gratefully appreciated and thanking you in advance.

Sincerely,

Herbert H. Lee

Herbert H. Lee

P.S. If you are ever out this way please stop in as I would be very happy to see you, and I will do the same if ever I come to Washington D.C.

RECEIVED
FEB 4 1957
D.M.E.A.

RECEIVED
FEB 4 1957
D.M.E.A.

FILE COPY

400

Martin
Hedges
Selfridge

APR 19 1954

Mr. Rene Engel, Manager
Rene Engel and Associates
1222 Blair Avenue
South Pasadena, California

Re: Docket No. DMEA 3156 - Tungsten
Pala Tungsten Claims
Kern County, California

Dear Mr. Engel:

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

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.

Careful study of all our information indicates that although some tungsten-bearing tactite occurs on your property, the probability of disclosing minable tungsten ore reserves by your proposed exploration program is not sufficiently promising to justify Government participation. We regret to advise, therefore, that your application for exploration assistance is denied.

However, our review of the available reports suggests that mining the ore now known in the old open cut would soon demonstrate whether there is any worthwhile persistence to what appears to be the best showing in the area. If structure continuity can be demonstrated by such mining, or the possible existence of similar ore-bearing structures on your property shown, we shall be glad to consider a new application based upon an exploration program of those new target areas.

We wish to thank you for your interest in the Defense Minerals Exploration Administration program and for bringing your property to our attention.

Sincerely yours,

C. O. Mittendorf (fw)

Administrator

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

JHopkins/FEJohnson/ls 4/19/54

R.C.S.

400
Docket
Surname

Hopkins
Martin
(c.2) Johnson
Garratt
Selfridge

Mr. Rupe Engel, Manager
Rupe Engel and Associates
1222 Kinsley Avenue
South Pasadena, California

Re: Docket No. DMEA 3136 - Tungsten
Fels Tungsten Claims
Kern County, California

Dear Mr. Engel:

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

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.

Careful study of all our information indicates to us that although your proposed program is unusually well designed the probability of disclosing minable ore reserves at the subject prospect is not sufficiently promising to justify Government participation at this time. We regret to advise you, under these circumstances, that your application for exploration assistance is denied.

Our denial is made without prejudice to the property insofar as production is concerned. Furthermore, our review of the available reports suggests to us that mining the ore now known in the old open cut would quickly demonstrate whether there is any worthwhile persistence to what appears to be the best ore body in the area.

We wish to thank you for your interest in the Defense Minerals Exploration Administration program and for bringing your property to our attention.

Sincerely yours,

Administrator

JHopkins:foc
4-14-54
cc to: Docket
Code 400
Adm. Reading File
Operating Comm.
FT. Reg. III
R. W. Geehan, USBM
T. P. Thayer, USGS

400

Docket
Surname

Hopkins
Martin

April 14, 1954

MEMORANDUM

To: Administrator

From: Iron and Ferro-Alloys Division

Subject: Denial of application for exploration assistance in the amount of $20,000.00
Docket No. DMEA 3156 - Tungsten
Rene Engel and Associates
Pala Tungsten Claims
Kern County, California

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

1. The applicant requested exploration assistance in the amount of $20,000.00 to explore for tungsten on the Pala Tungsten Claims, Kern County, California.

2. The Pala tungsten property is located near the south end of the Sierra Nevada mountains in a pendant of metamorphics in plutonic rocks. In alteration zone of tactite and cal-silicate rocks containing the tungsten mineral scheelite occurs in the marble near a south contact with granodiorite.

3. The mine workings consist of two drifts, 14 feet and 25 feet long, respectively; two crosscuts 75 feet and 27 feet long, respectively; one large open cut; one stope; and about 300 feet of surface cuts averaging 3 feet in width and 5 feet in depth.

4. The tungsten mineral scheelite occurs sporadically disseminated in the tactite. The tactite bands are fairly continuous along the granodiorite contact for a distance of 350 feet. The scheelite concentrations are spotty and erratic in extent.

R.C.L.

5. The two tactite bands overlap each other along their strike. The one developed in the open cut is shown to be 2 to 6 feet thick in the cross-cutting trenches and bulls out to a zone of mixed tactite and marble over 50 feet wide in the open cut. The other band is parallel to and 20 feet south of the first band, is 240 feet long and 1 to 5 feet thick. It appears to contain fewer and poorer concentrations of scheelite than the first band.

6. The analyses and locations of 10 samples taken during the examination from the underground and surface workings are as follows:

Sample No.	Length	% WO_3	Location
BM-521	1.0 feet	0.45	4 feet above floor-face lower tunnel drift
522	1.6 "	1.84	2.5 " " " " " " "
523	2.0 "	0.01	3.5 " " " " " " "
524	3.5 "	0.77	4.5 " " " " " " "
525	5.5 "	0.50	east end of steps
526	1.5 "	.45	Cut 1 W
527	5.0 "	0.72	Cut 2 AW
528	2.8 "	0.36	Cut 5 W
529	1.5 "	0.37	Cut 6 AW
530	1.0 "	1.00	Cut 7 W (from both sides of cut)

7. The examining engineers estimate ore reserves as follows:

On the southern band of tactite between trench C6W and 5 feet west of C7W might be expected to contain an average of 0.5 percent WO_3. A block of scheelite-bearing tactite 5 feet wide, 48 feet long and 24 feet deep might be inferred to contain 576 tons of rock containing 288 units of WO_3.

On the northern band, assuming that geologic conditions and grades of scheelite exposed on the surface are duplicated at the level of the lower tunnel, a block of scheelite-bearing tactite is inferred 60 feet on strike by 5 feet wide by 25 feet deep, amounting to 750 tons and containing 0.57 percent or 428 units of WO_3.

The reserves are considered sub-marginal, or marginal at most, in value.

8. The past production is not known but probably included several hundred tons of scheelite-bearing ore mined from an open cut and a small stope that had a grade of between 0.5 and 0.6 percent WO_3.

9. Because the scheelite concentrations are spotty and erratic in extent, the examining engineers conclude that there is very small probability that the Government would be reimbursed for the amount of its participation in almost any program of exploration that might be considered.

10. The examiners recommend that DMEA funds for exploration of the Pala Tungsten claims be denied.

11. The Field Team concurs in the denial.

12. The Commodity Divisions of the Geological Survey and Bureau of Mines concur in the denial.

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

JHopkins/fec
4-14-54
cc to: Docket
Code 400
Adm. Reading File
Operating Comm.
Mr. Hopkins

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

April 14, 1954

MEMORANDUM

To: Administrator

From: Iron and Ferro-Alloys Division

Subject: Denial of application for exploration assistance in the amount of $20,000.00
Docket No. DMEA 3156 - Tungsten
Rene Engel and Associates
Pala Tungsten Claims
Kern County, California

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

1. The applicant requested exploration assistance in the amount of $20,000.00 to explore for tungsten on the Pala Tungsten Claims, Kern County, California.

2. The Pala tungsten property is located near the south end of the Sierra Nevada mountains in a pendant of metamorphics in plutonic rocks. An alteration zone of tactite and cal-silicate rocks containing the tungsten mineral scheelite occurs in the marble near a south contact with granodiorite.

3. The mine workings consist of two drifts, 14 feet and 25 feet long, respectively; two crosscuts 75 feet and 27 feet long, respectively; one large open cut; one stope; and about 360 feet of surface cuts averaging 3 feet in width and 5 feet in depth.

4. The tungsten mineral scheelite occurs sporadically disseminated in the tactite. Two tactite bands are fairly continuous along the granodiorite contact for a distance of 350 feet. The scheelite concentrations are spotty and erratic in extent.

5. The two tactite bands overlap each other along their strike. The one developed in the open cut is shown to be 2 to 6 feet thick in the cross-cutting trenches and bells out to a zone of mixed tactite and marble over 50 feet wide in the open cut. The other band is parallel to and 20 feet south of the first band, is 240 feet long and 1 to 5 feet thick. It appears to contain fewer and poorer concentrations of scheelite than the first band.

6. The analyses and locations of 10 samples taken during the examination from the underground and surface workings are as follows:

Sample No.	Length	% WO_3	Location
BM-521	1.0 feet	0.45	4 feet above floor-face lower tunnel drift
522	1.6 "	1.04	2.5 " " " " " " "
523	2.0 "	0.01	3.5 " " " " " " "
524	3.5 "	0.77	4.5 " " " " " " "
525	5.5 "	0.50	east end of stope
526	1.5 "	0.45	Cut 1 W
527	5.0 "	0.72	Cut 2 AW
528	2.8 "	0.36	Cut 5 W
529	1.5 "	0.29	Cut 6 AW
530	1.0 "	1.00	Cut 7 W (from both sides of cut)

7. The examining engineers' estimate ore reserves as follows:

On the southern band of tactite between trench C6W and 5 feet west of C7W might be expected to contain an average of 0.5 percent WO_3. A block of scheelite-bearing tactite 5 feet wide, 48 feet long and 24 feet deep might be inferred to contain 576 tons of rock containing 288 units of WO_3.

On the northern band, assuming that geologic conditions and grades of scheelite exposed on the surface are duplicated at the level of the lower tunnel, a block of scheelite-bearing tactite is inferred 60 feet on strike by 5 feet wide by 25 feet deep, amounting to 750 tons and containing 0.57 percent or 428 units of WO_3.

The reserves are considered sub-marginal, or marginal at most, in value.

8. The past production is not known but probably included several hundred tons of scheelite-bearing ore mined from an open cut and a small stope that had a grade of between 0.5 and 0.6 percent WO_3.

9. Because the scheelite concentrations are spotty and erratic in extent, the examining engineers conclude that there is very small probability that the Government would be reimbursed for the amount of its participation in almost any program of exploration that might be considered.

10. The examiners recommend that DMEA funds for exploration of the Pala Tungsten claims be denied.

11. The Field Team concurs in the denial.

12. The Commodity Divisions of the Geological Survey and Bureau of Mines concur in the denial.

W S Martin

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

April 9, 1954

Memorandum

To: W. S. Martin, DMEA

WSM

From: Robert W. Geehan

Subject: Pala Tungsten Claims - DMEA 3156
Rene Engel and Associates
Kern County, California

Applicant proposes 1,200 feet of diamond drilling which, if favorable, would be followed by underground exploration comprising 150 feet of drifting and crosscutting, and 70 feet of raising. Applicant estimated a cost of $20,000. The field team recommends the application be denied.

The diamond drilling could do no more than establish the extent of the tactite and other rock formations; tungsten mineralization at the deposit is too spotty for this method of exploration. The excellent exploration work done from the surface has not revealed a good target for underground exploration. The area below the old open cut has not been completely investigated. This area is the only portion of the deposit that would seem to have a potential for production of significant quantities of ore. The field team report does not contain a section indicating the geological structure at the bottom of the wide tactite zone. The lower tunnel contains very little tactite.

I concur with the field team conclusions that the diamond drilling phase should be denied. The only area that appears favorable for underground work has been tested, in large part, by the lower tunnel. If the applicant mines ore now known in the open-cut area any continuation of the wide tactite will be exposed. Rejection of the project should provide for another application if additional work demonstrates a "target."

Robert W. Geehan

Robert W. Geehan

IN REPLY REFER TO:

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

Docket

April 8, 1954

Memorandum

To: W. S. Martin, DMEA

WSM

From: E. L. Newcomb, USGS

Rene Engel & Assoc.

Subject: Concurrence with Field Team denial
Docket DMEA-3156 Pala Tungsten Claims
Greenhorn District Kern County, Calif.

The applicant proposes to explore his claims by 1200 feet of diamond drilling which, if successful, would be followed by 150 feet of drifting and crosscutting, and 70 feet of raising.

The field team recommends the application be denied.

Inferred reserves were estimated by the field team to be about 1300 tons averaging 0.5 - 0.6 percent WO_3.

The nature of the scheelite deposits as localized pods which are erratically distributed along a tactite zone indicates that significant amounts of tungsten ore are unlikely to be found by the proposed work. Drilling tactite zones containing small pods of mineralization would provide very little information and the intersection of ore would be strictly a matter of chance. The amount and grade of mineralization exposed on the property does not justify the expenditure of Government funds. Sufficient work has been done to indicate that more continuous and higher grade deposits cannot reasonably be expected at depth.

I concur with the field team examiners' conclusions and recommend the application be denied.

E. L. Newcomb

E. L. Newcomb

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

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

March 24, 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-3156 - Tungsten
Rene Engel and Associates
Pala Tungsten Property
Kern County, California

Reference is to your letters dated October 5, 1953, and March 3, 1954, relating to a field examination of the subject property.

The examination has now been made and there are attached four copies of a report entitled "DMEA-3156, Pala Tungsten Claim Group, Kern County, California," by J. F. Robertson and H. K. Stager, Geologists, U. S. Geological Survey, and F. J. Wiebelt, Mining Engineer, U. S. Bureau of Mines, dated March 15, 1954.

The engineer and geologists recommend that the application for a loan be denied. They point out in their report that the tungsten mineral scheelite occurs sporadically disseminated in an alteration zone of tactite and calc-silicate rocks, that the scheelite concentrations are spotty and erratic, and that they do not believe that sufficient ore can be indicated to warrant an exploration loan.

I am not personally acquainted with the property and agree with the engineer and geologists that the scheelite mineralization is spotty and somewhat erratic. It must be admitted, however, that some of the spots are fairly good ore.

The information shown on the assay map makes me wonder if there isn't a possibility of an ore body somewhere along the line of excavations. I would be interested in hearing from your tungsten experts on what they think.

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

Thru OC
4-2-54

Attachment

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION III

DMEA-3156, Pala Tungsten Claim Group

Kern County, California

J. F. Robertson, Geologist
H. R. Stager, Geologist
U. S. Geological Survey

F. J. Wiebelt, Mining Engineer
U. S. Bureau of Mines

March 15, 1954

Reviewed by
DMEA OPERATING COMMITTEE
4-2-54
(date)

EXAMINATION REPORT

Docket No.: DMEA-3156 (Tungsten)

Name and address of applicant: Rene Engel & Associates
1222 Blair Avenue
South Pasadena, Calif.

Name and location of property: Pala Tungsten Claim Group
Kern County, California

SUMMARY

Pursuant to an "Application for Aid in an Exploration Project" an examination of the Pala tungsten property in Kern County, Calif., was made by two geologists of the Geological Survey and an engineer of the Bureau of Mines.

The mine is three miles northwesterly of Wofford Heights, which town is four miles southwest of Kernville, Calif.

The tungsten mineral scheelite occurs sporadically disseminated in an alteration zone of tactite and cal-silicate rocks which occur in marble near a contact with granodiorite. It is estimated that the mine has 1,326 tons of approximately 0.54% WO_3 content inferred ore reserves.

Ten samples were taken from the property by the examiners.

The applicants proposed exploration plan consists of 1200 feet of diamond drill holes and if results of drilling are favorable then the drilling program will be followed by a certain amount of underground exploration work consisting of 150 feet of drifting and crosscutting and 70 feet of raising. The applicant estimates the total cost of the proposed work

at $20,000.00.

CONCLUSIONS

The trenches, open cuts, and underground workings adequately outline the extent of the deposit and assays of samples are believed to be representative. The expectable grade of the deposit explored by the proposed drilling would not materially change from that which is now exposed. Calculation of ore reserves shows that only a small tonnage of scheelite-bearing tactite can be inferred containing little better than 0.5 percent WO_3, which gives marginal to submarginal value to the deposit. The scheelite concentrations are spotty and erratic in extent and it is doubtful that this grade of deposit can be mined, let alone be explored, and show any margin of profit at the present time. There is very small probability that the Government would be reimbursed for the amount of its participation for practically any program of exploration that might be considered.

RECOMMENDATIONS

The examiners recommend that DMEA funds for exploration at the Pala Tungsten claims be denied.

INTRODUCTION

The examiners, consisting of Jacques Robertson and Harold Stager of the U. S. Geological Survey and Frank J. Wiebelt of the Bureau of Mines, spent Jan. 26 and 27, 1954 on the property. They were accompanied during the examination by Rene Engel and W. C. Goth of the company.

NAME AND LOCATION OF PROPERTY

The Pala Tungsten mine is accessible from Wofford Heights, a town four miles southwest of Kernville, Calif., by three miles of fairly well-graded dirt road known as Evans Road. The property is in Kern County, California in the eastern portion of the Greenhorn Mountain Mining District. It lies in section 25, T. 25 S., R. 32 E., M.D.B.&M. The mine is also known as the "Andrews" and the "Reagan" mine.

ACCESSIBILITY

The property is accessible throughout most of the year except in periods of heavy snowfall. The property lies close to the bottom of the snowfall line.

COMPETENCY OF APPLICANT

The applicant supplied excellent maps with the docket. The trenches and underground workings were open and in good condition for the examination and his samples appear to be accurate and reliable. His estimate of possible tonnage reserves are much too high. The applicant (Mr. Rene Engel) was very cooperative during the examination.

APPLICANT'S PROPERTY RIGHTS

The applicants, Rene Engel & Associates, have a lease on the property from the owners of "Pala Ranches" of Kernville, Calif. The property consists of six unpatented lode claims. The names of the claims and the book and page numbers of records of location notices as reported in the applicants' application follows:

Pala No. 1 or Old Andrews Tungsten,	recorded in	book	1725,	p. 306
Pala No. 2 or Andrews No. 2	"	"	" 1825,	p. 238
Pala No. 3	"	"	" 1987,	p. 3
Pala No. 4	"	"	" 1987,	p. 5
Pala No. 5	"	"	" 54983,	(1952)
Pala No. 6	"	"	" 54984,	(1952)

The above are recorded in the official records of Kern County, Calif.

DESCRIPTION OF PROPERTY

No buildings are on the property and the mine equipment consists of a 105 cu. ft. compressor with Waukesha gasoline engine and a 1-ton mine car.

Mine workings consist of two drifts, 14 feet and 25 feet long respectively; two crosscuts, 75 feet and 27 feet long, respectively; one large open cut; one stope; and about 360 feet of surface cuts averaging about 3 feet in width and 5 feet in depth. The applicant supplied excellent geologic and topographic maps with the docket. A map covering that portion of the property on which the proposed exploration work was contemplated is shown in fig. 2 which accompanies this report.

The location of 10 samples, taken during the examination, from the underground and surface workings are shown in fig. 2. The analyses and other data pertaining to these samples follows:

Sample No.	Length	%, WO_3	Location
BM-521	1.0 feet	0.45	4 feet above floor - face lower tunnel drift
BM-522	1.6 "	1.04	2.5 feet " " " " " "
BM-523	2.0 "	*0.01	3.5 feet " " " " " "
BM-524	3.5 "	0.77	4.5 feet " " " " " "
BM-525	5.5 "	0.50	east end of stope
BM-526	1.5 "	0.45	cut 1 W.
BM-527	5.0 "	0.72	cut 2 AW
BM-528	2.8 "	0.36	cut 5 W.
BM-529	1.5 "	0.29	cut 6 AW
BM-530	1.0 "	1.00	cut 7 W (from both sides of cut)

*Less than.

GEOLOGY

The Pala tungsten property is located near the south end of the Sierra Nevada in the Kernville quadrangle, Kern County, Calif., that was mapped by Miller and Webb.[1/] It is in a pendant of metamorphics in plutonic rocks 3 miles west of old Kernville near the west boundary of the quadrangle. Geology within the claims has been mapped in detail by the applicant on the scales of 1 inch equals 40 feet and 1 inch equals 10 feet; the aerial map accompanies the docket and the larger scale map of the workings is included in this report.

The geologic setting consists of a lens of blue-gray to white marble bounded by biotite schist, phyllite, and gneiss on the north and east sides and partly on the south. An alteration zone of tactite and calc-silicate rocks that contain the tungsten mineral scheelite occurs in the marble near a south contact with granodiorite. Prospect trenches and mine workings that are concentrated in this area expose the tactite and mixed rock.

1/ Miller, W. J., and Webb, R. W., 1940, Descriptive geology of the Kernville quadrangle, California: Calif. Jour. of Mines and Geology, vol. 36, p. 343-378.

In contact with the marble and meta-sediments to the northwest is a granitic phase of the Isabella granodiorite.

The contact between coarsely crystalline marble and granodiorite trends N. 80° E. and is essentially vertical, which attitude conforms to bedding in the marble. Marble near the contact has been invaded and altered to form two well-defined but narrow bands of mixed rock that include calc-silicates and scheelite-bearing tactite. Tactite that occurs as small lenses farther within the marble contains only traces of scheelite. On the accompanying map (fig. 2) the rocks are classified in detail.

Metamorphism has differentially affected the marble. Some of it is altered to a light-colored calc-silicate, locally made up of identifiable wollastonite, calcite, garnet, and epidote. Other minerals such as diopside and tremolite may be present locally. The tactite consists mainly of dark reddish-brown garnet, epidote, and green amphibole. Thin quartzitic interbeds in the marble appear to be only recrystallized but may be partly secondary. Greenish-gray bands of fine-grained slightly schistose rock, referred to as "dolerite", are either diabasic dikes or calc-silicate granulites. A medium-grained granulite containing felspar, amphibole, and pyroxene occurs between tactite and "dolerite" in the lower series of trenches. It is a hybrid rock, probably a contact phase between the calc-silicate and granodiorite. The granodiorite itself is medium-grained, equigranular, and contains feldspar, quartz, biotite, and hornblende. It is well exposed along the road to the south below the

trenches and at the portal of the lower tunnel. In the trenches is a white, fine- to medium-grained rock that the operator referred to and mapped as "pegmatite". A better field term is "aplite", although the rock may actually be related to the calc-silicates.

The few faults exposed or apparent in the area of the workings do not seem to produce significant displacement of the tactite zone or influence the distribution of scheelite. No folds were observed in the rock in the area of the workings, although they are reported by the operator to occur in the marble some distance from the workings.

SCHEELITE DEPOSITS

The tungsten mineral scheelite occurs sporadically disseminated in the tactite in crystals rarely as large as 2 millimeters. Although the tactite is fairly continuous along the granodiorite contact for a distance of 350 feet, the scheelite concentrations are spotty and erratic in extent. Except for traces in small pods of tactite in the marble, scheelite is confined to the two tactite bands exposed by the trenches and underground workings.

The two tactite bands overlap each other along their strike. The one that has been developed in the open cut can be traced for 170 feet. In the crosscutting trenches it ranges from 2 to 6 feet thick, but bells out in the open cut to a zone of mixed tactite and marble over 50 feet wide. The other band is parallel to and 20 feet south of the first band, is 240 feet long, and 1 to 5 feet thick. It appears to contain fewer and poorer concen-

trations of scheelite than the first band.

No scheelite was observed in quartz veins as suggested by the applicant. The short drift in the lower tunnel exposes 4 or 5 pods of scheelite-bearing tactite that average 2 feet thick by 4 feet long. They are located 40 to 50 feet vertically below the surface exposures in the open cut, and appear to be the down dip portion of the first band described above.

ASSAYS AND RESERVES

Inspection of the tactite band in the southern-most series of trenches with ultraviolet lamp showed none or only traces of scheelite. The applicant suggested that sluff from the trench sides and slope wash had covered the exposures, but diligent picking of the trench walls and floor uncovered no significant mineralization. Assays for WO_3 by the Ed Eisenhauer Laboratories in Los Angeles from samples taken by the applicant indicate that the scheelite is probably below commercial grade. The highest value obtained is from sample P37 in trench C7W (see fig. 2), 5.7 feet of tactite assaying 0.72 percent WO_3. The other low values from the applicant's assays along this tactite band show that the concentration of scheelite drops off steeply from this value, and the lack of showings with ultraviolet lamp suggest erratic distribution. Roughly calculated, about 48 feet along strike of this band, from trench C6W to 5 feet west of trench C7W, might be expected to contain an average of 0.5 percent WO_3. At the most, a block of scheelite-bearing tactite 5 feet wide by an estimated 24 feet deep

might be inferred that amounts to about 576 tons of rock containing 0.5 percent or 288 units of WO_3.

Although the northern or upper band of tactite gives indications of more scheelite than the southern band with the UV lamp, it also shows mostly low values with rather spotty concentrations of WO_3. Samples were taken for assay by the field team from showings in the trenches that exposed the upper band of tactite, and the values obtained by the Bureau of Mines are recorded on the accompanying map. Some of the applicant's sample assays shown on the map are given as checks against the DMEA assays, and for those locations where no samples were taken by the field team. Sample P9, which was taken by the applicant and assayed 1.45 percent WO_3, was from a small concentration of scheelite-bearing tactite one foot wide. The spot of scheelite had been removed sometime before the examination and scheelite that is left is much lower in value. Sample P9 is, therefore, not representative. However, the others are considered to be fairly reliable. The width of the band of scheelite in tactite is irregular on the surface, ranging from 1 to 5 feet. In the near-surface stope the scheelite is present in a pod of tactite 12 feet across from north to south. The samples from trenches C2AW and C1W, and from the stope and open cut, average 0.57 percent WO_3, weighted over a minimum width of 5 feet and for a length of 60 feet, ignoring sample P9.

The tactite exposed in the lower tunnel is undoubtedly the projection downward, 25 feet vertically, of the band on the surface. The weighted average of assays from DMEA samples gives a value of 0.75 percent WO_3 for a minimum width of 5 feet, but the tactite is exposed along strike for only 15 feet. Assuming that geologic conditions and grades of scheelite exposed on the surface are duplicated at the level of the lower tunnel, a block of scheelite-bearing tactite is inferred 60 feet on strike by 5 feet wide by 25 feet deep, amounting to 750 tons and containing 0.57 percent or 428 units of WO_3. Possibly, small pods of higher grade scheelite exist in this ground like that shown by sample P9, which might raise the grade. More likely such hot spots are offset by equally barren areas.

Sample BM #530 in trench C 7W appears to be another relatively rich but small spot that has little significance over the whole deposit.

PAST OPERATION

The mine was originally known as the old Andrews or Reagan tungsten mine and operated during the second World War.

The past production is not known but it is probable that several hundred tons of scheelite-bearing ore was mined from an open cut and a small stope. The grade of the ore probably was between 0.5 and 0.6 percent WO_3.

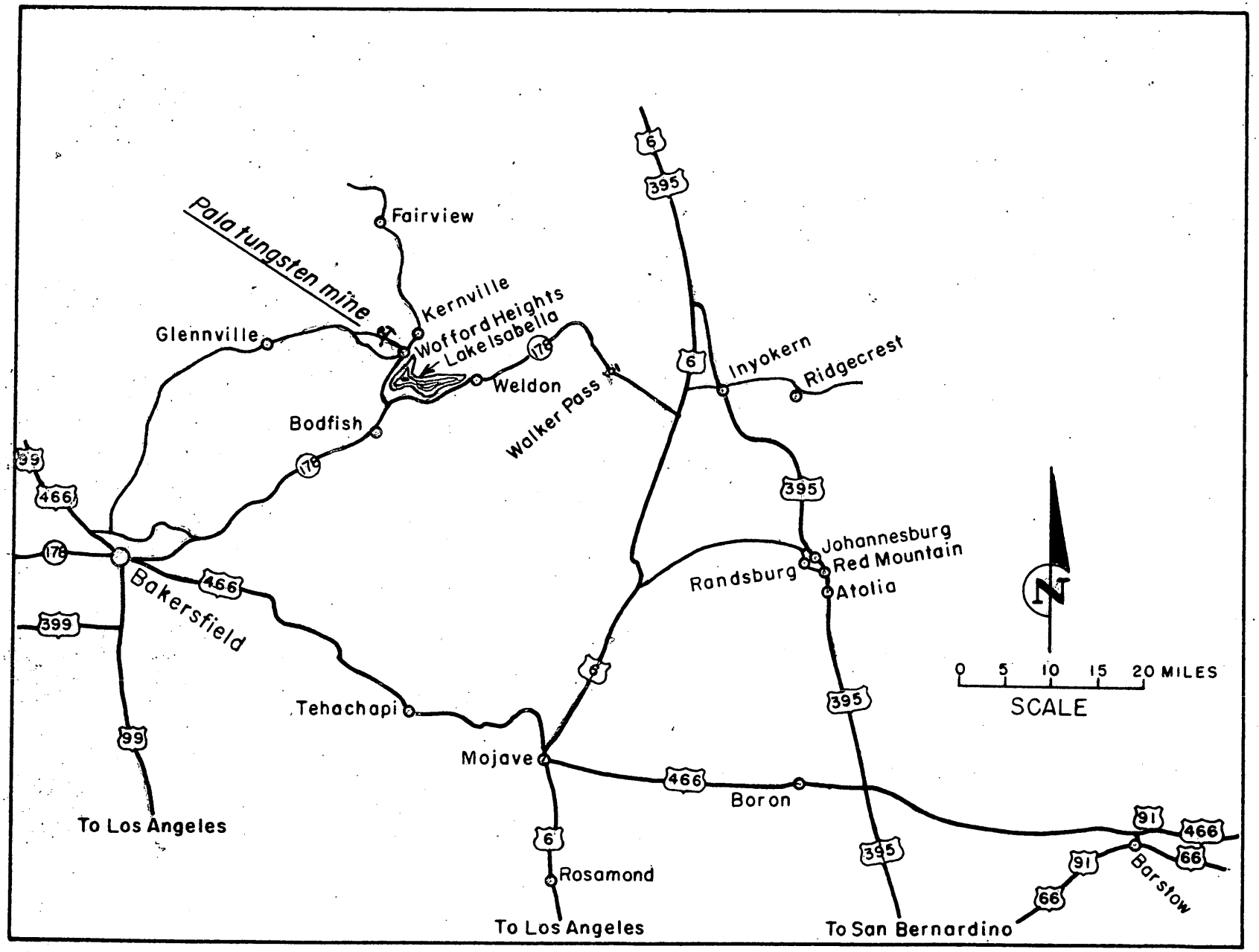
MANPOWER, SUPPLIES, ETC.

Manpower is available either in Kernville or Bodfish, about 8 miles south of Wofford Heights. Materials and supplies may be obtained in Kernville or in Bakersfield. Water may be had either from Cane Creek in the canyon below the property or Tillie Creek across the road to the west. A Southern California Edison Company power line is located about 1400 feet south of the property.

APPLICANT'S PROPOSAL

The applicant's proposal consists of 1200 feet of diamond drill holes, which if proved favorable, would be followed by underground exploration work consisting of 150 feet of drifting and crosscutting, and 70 feet of raising. The total estimated cost according to the applicant would be $20,000.00.

The examiners do not believe the above program or any other substitute program would result in sufficient returns to warrant the participation of the Government in an exploration project at the Pala tungsten claims.



Location map, Pala tungsten mine, Rene Engel & Associates, Kern County, California.

Figure 1.

Docket

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

RECEIVED
MAR 16 1954

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

March 12, 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-3156 - Tungsten
Rene Engel and Associates
Pala Tungsten Property
Kern County, California

Reference is made to your letter dated March 3, 1954, requesting advice as to when you may expect the field team's report and recommendations on the subject property.

Roscoe Smith advises that the geologist's contribution to a joint report was mailed to Reno on March 10. As the Reno office advises that the Bureau of Mines part of the report is being held pending receipt of the geological report, it should not be very long now before the complete report reaches my desk for transmittal to you.

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

Copy to: Roscoe Smith, USGS

PALA RANCHES,
VERNVILLE, Calif.
3/19/54

Copy retained 400

docket

400

Rutledge
Martin
Selfridge
Kilbourne
Mathews

MAR 3 1954

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 3156 - Tungsten
Rene Engel and Associates
Pala Tungsten property
Kern County, California

Dear Mr. Miller:

The above-docketed application for exploration assistance was referred to the Field Team for review and a field examination on October 5, 1953. The Region III monthly report for January 1954 noted that a report was in preparation.

We have recently received an inquiry regarding our decision concerning the subject application. We will, therefore, appreciate being advised when we may expect the Field Team's report and recommendations.

Sincerely yours,

George C. Selfridge
Chairman, Operating Committee

APPROVED:

J. H. Hedges
Member, Bureau of Mines

D. M. Larrabee
Member, Geological Survey

Copy to: DOCKET
FT, REG. III
CODE 400
OPER. COMM.
ADM. READ. FILE
R. W. GEEHAN, USBM
T. P. THAYER, USGS

FARutledge/ls
3/3/54

R.C.S. 3-4-54

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

Defense Minerals Administration
RECEIVED
OCT 20 1953

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

October 16, 1953

WSM

Mr. Rene Engel, Manager
Rene Engel and Associates
1222 Blair Avenue
South Pasadena, California

Re: Docket No. DMEA-3156 - Tungsten
Rene Engel and Associates
Pala Tungsten Property
Kern County, California

Dear Mr. Engel:

Your application for exploration assistance has been referred to this office for review and a field examination of the property.

A review of your application and the accompanying geologic map shows that you have done a good deal of careful work. Much critical information, however, is omitted. Complete assay data should be provided, along with documentation of geologic relations indicated by underground workings. In the absence of data on elevations and complete assay data there is no way of checking your estimate of "a possible tonnage of "50,000 tons of ore at 0.7 percent WO_3 or better".

The proposed diamond drilling program may be questioned. Fanning drill holes from setups on essentially vertical narrow deposits would give only a fraction of the information that would be gained by inclined holes from the hanging wall side. You apparently intend to do some blind drilling on fold apexes - a questionable procedure where so little appears to be known about exposed deposits. The size of core specified (EX) is too small for effective sampling in a deposit as spotty as the limited assay data indicate this one to be.

Kindly furnish this office with the requested missing information, and elaborate also on the theory behind the spotting of the drill holes. Upon receipt of the requested information we will give further consideration to your application and the need for a field examination.

Sincerely yours,

H. C. Miller

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

Copy to: DMEA, Washington, D. C.
E. H. Bailey, USGS

400

FILE COPY
SURNAME:

Rutledge
Martin
Kelsey
Selfridge
Hopkins

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

OCT - 5 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 3156 - Tungsten
Rene Engel and Associates
Pala Tungsten property
Kern County, California

Dear Mr. Miller:

Reference is made to the subject application for exploration assistance, which is being referred to your office for review and a field examination of the property.

A memorandum dated September 9, 1953, by Mr. T. P. Thayer, U. S. Geological Survey, has been prepared and is enclosed for your information.

Please note Mr. Thayer's recommendation regarding the omission of critical information and the applicant's theory covering spotting of the drill holes. We suggest that you request the applicant to supply the missing information direct to your office.

Sincerely yours,

George C. Selfridge (JB)
Chairman, Operating Committee

Enclosure

cc: Docket
FT, Reg. 3
Code 400
Oper. Committee
Adm. Read. File
R. W. Geehan, USBM
Mary Miller, USGS

APPROVED:

J. H. Hedges
Member, Bureau of Mines (JB)

A. R. Kinkel, Jr.
Member, Geological Survey (JB)

JHopkins/ls
9/30/53

Copies made 1-26-54

R.C.G. 10-5-53

FILE COPY
SURNAME:

Rutledge
Martin
Meyer
Hughes
Rutledge

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

OCT - 5 1953

Mr. Rene Engel, Manager
Rene Engel and Associates
1222 Blair Avenue
South Pasadena, California

Re: Docket No. DMEA 3156 - Tungsten
Pala Tungsten Property
Kern County, California

Dear Mr. Engel:

Your application for assistance in exploring a tungsten occurrence on the Pala Tungsten property, Kern County, California, has been reviewed by the Iron and Ferro-Alloys Division, DMEA, and has been referred to Mr. H. C. Miller, Executive Officer, DMEA Field Team, Region III, 1012 Flood Building, 870 Market Street, San Francisco, California, for further consideration and a field examination.

At the time a field examination is made of the property, any assistance that you can render the examining engineers will be appreciated.

Sincerely yours,

Frank E. Johnson
ACTING Administrator

cc: Docket
Field Team, Reg. 3
Code 400
Admr. Read. File
Mary Miller, USGS
R. W. Geehan, USBM

JHopkins/ls
9/30/53

R.C.J.
10-5-53

Opinion of Mr. A. E. Tana

Because we O.C.L. for the six claims of the Pala Group, if we write Annex II of a contract, we must specifically include Pala #5 and Pala #6 by reason of Paragraph No 2 of the lease

Sept 29, 1953

DMA 2131 TUNC Idm-E-214

9/14/53--Memo to Adm. Re: General summary of contract & results obtained.

Telephone:
Albany 0912

RENÉ ENGEL
PH. D.; CH. E.
GEOLOGIST AND CHEMICAL ENGINEER
1222 BLAIR AVENUE
SOUTH PASADENA, CALIFORNIA

Docket

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
SEP 29 1953

Sept.26,1953

Mr. Frank E.Johnson
Acting Administrator
Defense Minerals Exploration Administration
Washington,25,D.C.

WSM

Re:Rene Engel & Associates
Docket No.DMEA-3156
(Tungsten)
Pala Tungsten Property,
Kern County,California.

Dear Mr. Johnson:

In reply to your letter of September 21 regarding the two claims: Pala Nos.5 and 6 ,which are not specifically mentioned in the lease of September 30,1952, I wish to state that when this lease was made there were only four claims in the group and that subsequently,two more claims adjacent to the initial group were added.

In paragraph 2 of the lease,the Lessee is granted the privilege of working any mineral deposit on Lessor's properties "as an appurtenance of said demised premises"provided that additional claims staked on the Lessor's properties are recorded in the name of Lessor. As this clause applies to the two additional claims,Pala 5 and 6,it was thought that another lease was not needed.

This explains the discrepancy between the lease,on one hand, and the application and the Owner's consent to lien,on the other.

Sincerely yours,

Rene Engel

Rene Engel

FILE COPY
140 SURNAME:

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

SEP 21 1953

AEKane
Martin
Hoffman
Martin

Mr. Rene Engel
Manager
Rene Engel & Associates
1222 Blair Avenue
South Pasadena, California

Re: Rene Engel & Associates
Docket No. DMEA-3156
(Tungsten)
Pala Tungsten Property
Kern County, California

Dear Mr. Engel:

Your application for an exploration contract indicates that at least 6 claims have been leased to you, and the Owner's Consent to Lien is in accord with this, as is also the map which you have submitted. However, the lease itself, which was submitted with your letter of September 9, indicates that only 4 lode mining claims were leased.

It may be that you have another lease for the 2 claims not included in the lease submitted. If that is the case, please send us a copy. If the lease which you have sent us is in error, will you please send us a corrected copy?

Sincerely yours,

Frank E. Johnson

ACTING Administrator

AEKane:ep 9-18-53

Copy to: Mails & Files
Admr. Reading File
DMEA Field Team, Reg. III (2)
Mr. Martin (2)
Mr. Hofflund
Mr. Kane
Chron.
Pending

R.C.B. 9-21-53

phone:
Albany 0912

RENÉ ENGEL
PH. D.; CH. E.
GEOLOGIST AND CHEMICAL ENGINEER
1222 BLAIR AVENUE
SOUTH PASADENA, CALIFORNIA

Docket
DEPARTMENT OF THE INTERIOR
Defense Minerals Exploration Administration
Received
SEP 1 1953

September 9,1953

WSM

Mr.F.A.Rutledge
Acting Chief,Iron & Ferro-Alloys Division,
Defense Minerals Exploration Administration,
Department of The Interior,
Washington,25,D.C.

Re: Docket No.DMEA 3156-Tungsten
Pala Tungsten Property
Kern County,California

Dear Mr.Rutledge:

In answer to your letter of Sept.3 ,please find enclosed herewith four copies of the lease covering the Pala Tungsten property.

With my regrets for this omission,I am,

Sincerely yours,

Rene Engel

Rene Engel,Manager
Rene Engel & Associates.

Telephone:
Albany 0912

RENÉ ENGEL
PH. D.; CH. E.
GEOLOGIST AND CHEMICAL ENGINEER
1222 BLAIR AVENUE
SOUTH PASADENA, CALIFORNIA

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUL 16 1953

3156

Amen

July 11,1953

File: No reply necessary 7/16/53 WSM

Mr.C.O.Mittendorf
Administrator
Defense Minerals Exploration Administration
Washington,25,D.C.

Dear Mr. Mittendorf:

Please accept my belated thanks for your kind and helpful letter of March 27 prompted by a request I had made to my friend V.A.Brussolo about exploration assistance.

Unfortunately,due to the refusal of oneof the owners of the mining property I am leasing,to sign Form MF-103,I was unable to proceed with my plan to do some exploration drilling on some of the most promising contact zones revealed by geologic mapping carried for the last eight months,at my own expense and that of one associate,both of us being leasers and thus handicapped by the whims of the owners.

Considering the merits of that property and our needs for tungsten on one hand,then the average lack of understanding of the ordinary investor into mining research presented factually without "glamour"on the other,suggest aspects where the government assistance should be welcomed.

Sincerely yours,

Rene Engel

Rene Engel

COPY

L E A S E

This INDENTURE made the thirtieth day of September 1952, between Pala Ranches, Kernville, California, hereinafter designated the LESSOR, and René Engel and Associates, Pasadena, California, hereinafter designated the LESSEE,

W I T N E S S E T H:

That the Lessor, for and in consideration of the royalties, covenants and agreements hereinafter reserved, and by the Lessee to be paid, kept and performed, has granted, demised, leased and let, and by these presents does hereby grant, demise, lease and let unto the Lessee, all the following described mine and mining property situated in the Kernville Mining District, Kern County, State of California, to wit:

> Four lode mining claims, each of standard legal dimensions of 600 ft. by 1,500 ft., forming the Pala Tungsten mining claim group, situated in Section 25, T. 25 S., R. 32 E., Mt. Diablo base and meridian. Together with appurtenances and rights and privileges to prospect for tungsten and other metals and minerals, and to mine and extract the same, and to sell, mill, smelt, or otherwise beneficiate the same.

To have and to hold unto the said Lessee for the term of TEN (10) years from date hereof, expiring at noon on the thirtieth day of September 1962, unless sooner forfeited or terminated through the violation of any covenant hereinafter reserved against the said Lessee. This lease shall be automatically renewed for an additional TEN (10) year period, provided Lessee is performing in August and September 1962, profitable mining operations on one or more of the leased claims or other claims developed as hereinafter provided.

In consideration of the said lease, demise and privileges, the Lessee does hereby covenant and agree with the Lessor as follows, to wit:

(1) To prospect, map and sample the outcrops of the mineralized zones located on Lessor's property described above and also on Lessor's properties not specifically let hereunder, for a period of one (1) to six (6) months' duration from the date hereof, and to spend a minimum of one thousand dollars ($1,000) per month until work is completed, provided the performance of this work is

COPY

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(7) To allow said Lessor and his agent to enter upon and into all parts of said mine for the purpose of inspection and to furnish him copies of reports and data pertaining to the advance of mining work on Lessor's properties.

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IN WITNESS WHEREOF, the said parties, Lessor and Lessee, have hereunto set their hands and seals the year and day first above written.

PALA RANCHES - LESSOR

Signed by Paul H. Lacques

RENÉ ENGEL AND ASSOCIATES - LESSEE

Signed by René Engel

Certified to be a correct copy

René Engel

L E A S E

COPY

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W I T N E S S E T H:

That the Lessor, for and in consideration of the royalties, covenants and agreements hereinafter reserved, and by the Lessee to be paid, kept and performed, has granted, demised, leased and let, and by these presents does hereby grant, demise, lease and let unto the Lessee, all the following described mine and mining property situated in the Kernville Mining District, Kern County, State of California, to wit:

> Four lode mining claims, each of standard legal dimensions of 600 ft. by 1,500 ft., forming the Pala Tungsten mining claim group, situated in Section 25, T. 25 S., R. 32 E., Mt. Diablo base and meridian. Together with appurtenances and rights and privileges to prospect for tungsten and other metals and minerals, and to mine and extract the same, and to sell, mill, smelt, or otherwise beneficiate the same.

To have and to hold unto the said Lessee for the term of TEN (10) years from date hereof, expiring at noon on the thirtieth day of September 1962, unless sooner forfeited or terminated through the violation of any covenant hereinafter reserved against the said Lessee. This lease shall be automatically renewed for an additional TEN (10) year period, provided Lessee is performing in August and September 1962, profitable mining operations on one or more of the leased claims or other claims developed as hereinafter provided.

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PALA RANCHES - LESSOR

Signed by Paul H. Lacques

RENÉ ENGEL AND ASSOCIATES - LESSEE

Signed by René Engel

Certified to be a correct copy

René Engel

L E A S E

COPY

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> Four lode mining claims, each of standard legal dimensions of 600 ft. by 1,500 ft., forming the Pala Tungsten mining claim group, situated in Section 25, T. 25 S., R. 32 E., Mt. Diablo base and meridian. Together with appurtenances and rights and privileges to prospect for tungsten and other metals and minerals, and to mine and extract the same, and to sell, mill, smelt, or otherwise beneficiate the same.

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Signed by Paul H. Lacques

RENÉ ENGEL AND ASSOCIATES - LESSEE

Signed by René Engel

Certified to be a correct copy.

René Engel

L E A S E

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PALA RANCHES - LESSOR

Signed by Paul H. Lacques

RENÉ ENGEL AND ASSOCIATES - LESSEE

Signed by René Engel

Certified to be a correct copy.

René Engel

IN REPLY REFER TO:

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
SEP 10 1953

September 9, 1953

WSM

Memorandum

To: W. S. Martin, DMEA

From: T. P. Thayer, USGS

Subject: DMEA-3156, Tungsten
Rene Engel and Associates
1222 Blair Avenue
South South Pasadena, California

Copy retained 400.

The applicant proposes to drill and then drift on tactite bands in limestone on the Pala claims in Sec. 25, T. 25 S., R. 32 E., in the Greenhorn mining district, Kern County, California.

Although the Geological Survey examined the Greenhorn district in 1941, the files appear to contain no information on the deposits in question.

The geologic map shows that the applicant has done a good deal of careful work, but much critical information is omitted. Complete assay data should be provided, along with documentation of geologic relations indicated by underground workings. In the absence of data on elevations and complete assay data there is no way of checking the applicant's estimate of "a possible tonnage of 50,000 tons of ore at 0.7 percent WO_3 or better".

The proposed drilling program does not make sense. Fanning drill holes from setups on essentially vertical narrow deposits would give only a fraction of the information that would be gained by inclined holes from the hanging wall side. The applicant apparently intends to do some blind drilling on fold apexes - a questionable procedure where so little appears to be known about exposed deposits. The size of core specified (EX) is too small for effective sampling in a deposit as spotty as the limited assay data indicate this one to be.

Recommendations:

The applicant should be requested to provide the missing information above, and elaborate on the theory behind spotting of the drill holes.

With complete information, if the project seems worthy, it will be necessary to refer the application to the field.

T. P. Thayer

T. P. Thayer, Geologist

400

FILE COPY
SURNAME:

Hopkins
Rutledge

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

SEP 3 1953

Mr. Rene Engel, Manager
Rene Engel & Associates
1222 Blair Avenue
South Pasadena, California

Re: Docket No. DMEA 3156 - Tungsten
Pala Tungsten Property
Kern County, California

Dear Mr. Engel:

This will acknowledge receipt of your letter to the Administrator, DMEA, dated August 27, 1953, enclosing four copies of your application for exploration assistance together with maps, proposal costs and copy of Form MF-203.

We wish to call your attention to paragraph 2(d) of the application wherein you are requested to submit a copy of your lease, contract or other document under which you control the property.

Will you therefore kindly send us a copy of your signed lease at your earliest convenience.

Sincerely yours,

SIGNED

F. A. Rutledge
Acting Chief, Iron & Ferro-Alloys Division

JHopkins:foc
9-2-53
cc: Docket
Code 400
FT. Reg. 3
Adm. Reading File
R. W. Geehan, USBM
Mary Miller, USGS

R.C. 9-2-53

Rene Engel & Associates
1222 Blair Avenue
South Pasadena, California

September 1, 1953
Subject: DMEA-3156
Re: Exploration Assistance
Pala Tungsten

Dear Mr. Engel:

The receipt of your application dated August 25, 1953, for exploration assistance under the Defense Production Act of 1950, as amended, is hereby acknowledged.

Your application has been assigned Docket Number DMEA-3156 and referred to the Iron and Ferro-Alloys Division.

Kindly refer to DMEA-3156 in any future correspondence relating to your application.

Sincerely yours,

ROBERT E. ADAMS

Robert E. Adams
Chief, Operation's Control
and Statistics Division

Telephone:
Albany 0912

RENÉ ENGEL
PH. D.: CH. E.
GEOLOGIST AND CHEMICAL ENGINEER
1222 BLAIR AVENUE
SOUTH PASADENA, CALIFORNIA

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
SEP - 1 1953

August 27,1953

Mr.C.O.Mittendorf
Administrator
Defense Minerals Exploration Administration
Washington,25,D.C.

Dear Mr. Mittendorf:

As a sequel to my letter of July 11,I have the pleasure of being able to bring to your kind attention the fact that the owners of the Pala Tungsten property of which I am the lessee,accepted to sign form MF203 and thus allow me to complete the application for aid to pursue the exploration project.

Permit me to enclose herewith four complete applications with maps and estimates . I trust that all information required is adequately furnished,but should any additional data be needed,I shall be glad to do my best in obtaining it.

Yours sincerely,

Rene Engel

Rene Engel

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
SEP - 1 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-3156
Metal or Mineral
Date Received 9/1/53
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: Rene Engel & Associates
1222 Blair Avenue
South Pasadena, 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
PALA claim group composed of 6 lode mining claims situated in the Greenhorn mining district, Kern Co. California, in Section 25, T. 25 S., R. 32 E. Mt. Diablo B. & M. (see attached list of individual claims)

(*b*) State any mine name by which the property is known. Pala Tungsten (old names: Andrews, Reagan

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

(*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. (form MF-203 attached herewith)

(*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 list of claims)

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.

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

(*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.

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

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

5. *The exploration project.*—(*a*) S[redacted] the mineral or minerals for which you wish [redacted]xplore: 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.

(*c*) The work will start within 30 days and be completed within seven 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.

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.).

(*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.

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

(*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.

(*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.

(*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.

(*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.

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

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 [x] Other: Services

Explain in detail on acompanying paper.

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 August 25, 1953

Rene Engel & Associates
(Applicant)

By [signature]

Manager

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

Applicant: Rene Engel & Associates,
1222 Blair Avenue,
South Pasadena, California.

3-(a) & (f) List of unpatented lode mining claims of Pala Tungsten Claim Group.

Name:	Kern County Official Records:
Pala #1 or Old Andrews Tungsten	Book 1725, page 306
Pala #2 or Andrews No. 2	Book 1825, page 238
Pala #3	Book 1987, page 3
Pala #4	Book 1987, page 5
Pala #5	Document 54983, year 1952
Pala #6	Document 54984, year 1952
Pala Claim Group, Proof of Annual Labor	Document 35514, year 1953

4-Physical Description.

(a) Piecing-up together verbal accounts and a few facts seem to establish that the Pala #1 and #2 claims were originally located under the names "Andrew Mine" or "Old Andrews Tungsten Mine" and "Andrews No. 2" respectively, by a prospector now deceased, by the name of Andrews. Initial underground development was by a small adit located above and east of station 6 (see attached maps). During the Second World War, scheelite bearing ore was mined by means of an open-cut and a small stope on the west side of the quarry floor which are still visible to-day. No production records could be located, but it is estimated that about 500 tons of ore containing around 0.7% WO_3 were probably shipped.

Followed a period of abandonment, then relocation in 1947 and 1950 by Earl V. Pascoe, one of the present owners. Several annual labor performances resulted in a total of 75 ft. of cross-cutting and 10 ft. of drifting being made on the level off station 2 (see map).

Last June, 15 ft. of drift were added by the applicant on that same level. Mine workings are readily accessible for inspection.

On September 30, 1952, the applicant obtained from the owners a 10-20 year lease on the Pala Claim Group and started geological mapping and sampling of outcrops. On June 15, 1953, a total of 360 feet of trenches averaging a width of 4 ft. and a depth of 6 ft. had been cut across the tactite outcrops and 51 channel samples had been taken and analyzed for tungsten.

(b) As stated above, the past production is unknown and there is no current production.

Ore reserves are unknown because of insufficient development work. An estimate based on surface and underground mapping and sampling furnishes a possible tonnage of 50,000 tons of ore at 0.7% WO_3 or better, between the surface and the level of the lower tunnel (station 3=3765 ft.).

(c) The ore consists of scheelite contained either in tactite (epidote-garnet rock) or in quartz (veins associated with pegmatite or replacements in limestone) distributed along contacts between calcareous meta-sediments (marble and schists) and intrusives ranging from an early diorite to a later granodiorite and pegmatite. After considering for examination several strategic mineral prospects and subsequently examining several tungstem properties, the applicant selected the Pala prospect as deserving a geological study to ascertain whether or not exploration work was justified. The attached map at a scale of 1 inch=200 ft. resulted from a plane table survey conducted in the Fall of 1952. Later, the geological map at the scale 1 inch=40 ft. was made necessary to show the essential details revealed by the study of outcrops and their sampling. Assay values expressed in WO_3 % and thickness sampled are given on the detailed map.

(d) Access to the Pala property is assured by 3 miles of well graded dirt road: Evans road, running northwest from Wofford Heights on State Highway 178 between Isabella Dam and New Kernville. Living quarters and shopping facilities are available at Wofford Heights and New Kernville, 4 miles north of the former on Highway 178. Nearest railway shipping points are: Bakersfield (52.5 miles from the Pala property) and Inyokern (60.2 miles).

Applicant: Rene Engel & Associates,
1222 Blair Avenue,
South Pasadena, California.

4-Physical Description. (Cont.)

(e) Adequate manpower is available either in New Kernville or Bodfish, about 8 miles south of Wofford Heights. Current materials and supplies may be secured either in New Kernville or in Bakersfield. A stage runs daily from Kernville to Bakersfield and back. Water is available either from Cane Creek in the canyon below the property, or from Tillie Creek across the road to the west. Power is obtained at the present time by means of a gasoline engine (VIK Waukesha) connected to a compressor (I.R. 105 cu.ft.-2 stage air cooled) and a Warsop gasoline drill, all of which belong to the applicant. A Southern California Edison Company power line is located about 1400 feet south of the property.

5-The Exploration Project.

(b) The proposed plan is to establish at first the vertical and horizontal extent of the deposit by means of diamond drill borings located either on some of the largest scheelite-bearing tactite outcrops or on apices of folds marked by the thin bedded sandstone forming colored bands of quartzite in the marble body. In several instances, tactite bodies are located at or near these apices (see map), consequently in cases where no tactite outcrop is present, the occurrence of a fold apex may lead to a subjacent non-exposed tactite body when explored by drilling.

Depending upon the results obtained by drilling, a certain amount of underground exploration may then be made by drifting, cross-cutting and raising on and from the present level (station 2).

All drill cores and sludge are to be systematically collected, examined and described, sampled and analyzed for tungsten as the work progresses. Similarly, all faces opened-up by underground work are to be measured, geologically sketched and described, then channel sampled and assayed. These observations are to be correlated by mapping and preparing cross sections.

On the attached geological map at the scale of 1"=40 ft. the location of the proposed exploration work is shown by blue circles, numbered from 1 to 6, for diamond drill holes and dashed blue lines for underground workings. From one drill location several borings may be made, one vertical and several slanting depending upon results obtained in each case.

(d) Biography of Rene Engel, Applicant and Manager of exploration project. Degrees: Ph.D. in Geology (major) and Chemistry (minor), California Institute of Technology, 1933: M.S. in Mineralogy and Economic Geology, University of Paris, 1912: Chemical Engineer, University of Paris, 1909: Registered Assayer, Mint, Paris, 1909.

From:	To:	
10-1952	date	Manager, Pala Tungsten Research Project, Kernville, California.
9 -1948	7 -1952	Economic Geology Investigations in Cuba.
10-1946	6 -1950	Curator of Mineralogy and Petrology, Los Angeles County Museum, Los Angeles.
1 -1946	date	Consulting Geologist and Engineer, Pasadena, California.
2 -1945	8 -1945	Volunteer worker USAFFE (CIC&G2) and Am.Red Cross on civilian relief.
1 -1942	2 -1945	Civilian prisoner of war, Santo Tomas Int. Camp, Manila. Chairman and Instructor, Education Department.
6 -1940	1 -1942	Consulting Engineer, Marsman and Company, Manila: development of mineral and chemical industries in the P.I. and Orient.
1 -1935	6 -1940	Consulting Geologist and Engineer, Pasadena and San Francisco; Examination, prospecting and development for various principals on: Tungsten and Molybdenum: Adelanto, Atolia, Laurel Creek, California, and Rawhide, Nevada. Gold-Silver (lodes and placers): Alleghany, Argus Mts. Belden, Callahan (including magnetometric survey), Downieville, Julian, Mammoth Lake, Randsburg, Perris, California; Goldsfield, Rawhide, Tonopah and Divide, Nevada.

Applicant: Rene Engel & Associates,
1222 Blair Avenue,
South Pasadena, California.

5-(d) Biography of Rene Engel (Cont.)

From:	To:	
1 -1935	6 -1940	Salines: Trona, Calif. Clays: So. Calif. for Gladding McBean & Company, Los Angeles. Soil corrosion survey for pipe line project, Consolidated Copper Mines Corp.,Kinberly, Nevada.
1 -1926	1 -1935	Instructor in charge of Mineralogy, Petrology and Geochemistry, California Institute of Technology, Pasadena, California.
9 -1925	1 -1926	Graduate research in Geology, Stanford University,Palo Alto, California.
9 -1924	9 -1925	Assistant Professor of Geology and Mineralogy, New Mexico School of Mines, Socorro, N.M.
9 -1923	9 -1924	Professor of Geology and Mineralogy, Oklahoma School of Mines, Wilburton, Oklahoma.
11-1922	9 -1923	Engineer, Geological and Engineering Dept., A.C.M.Co., Butte,Mont.
5 -1921	11-1922	Shift boss in charge of underground diamond drilling, Mine Fire and Hydraulic Filling Dept.,A.C.M.Co.,Butte, Montana.
1 -1920	5 -1921	Draftsman,Mechanical Dept.A.C.M.Co.,Anaconda and Butte.
12-1918	9 -1919	Geologist and Inspector. Saar Coal Mines; member of Saar boundary commission, Saarbrucken, Germany.
6 -1917	12-1918	Member Scientific Commission, U.S. and Fixed Nitrogen Commission, England.
9 -1914	6 -1917	Chemical Engineer, Ordance Dept.Chemical Warfare Division.
9 -1913	9 -1914	Draftsman, Mechanical Dept.,A.C.M.Co.,Anaconda, Mont.
2 -1913	9 -1913	Assistant Testing Engineer,Testing Dept.,Anaconda Copper Mg.Co., Anaconda,Montana.
9 -1912	2 -1913	Assistant Superintendent, Rio Dolores Mining Co., Rico, Colorado.

Professional Affiliation:
American Institute of Mining and Metallurgical Engineers; Geological Society of America; Mineralogical Society of America; Sigma Xi.

Biography of William C. Goth, Supervising Resident Geologist. Degrees: A.A.General Science,Los Angeles City College, 1949; B.A. Geology, University of California at Los Angeles, 1951.

From:	To:	
10-1952	date	Geologist, Pala tungsten research project.
9 -1951	1 -1953	Graduate student, U.C.L.A. Twenty-six units of graduate work completed including seminars in Econ.Geol.; Dynamic Geol.; Geomorphology & Field Investigations in which field trips were taken to several California mines: Lead-Zinc. Anaconda Copper Mining Co.-Darwin; Quicksilver-New Idria; Gold-Idaho, Maryland Mining Co., Grass Valley.
8 -1951	8 -1951	Geologist, Stratigraphic studies Elk Hills as Lt.J.G.,U.S.N.R.,T.C. Tupman, California.
10-1951	12-1951	Clerical-IBM Operator, Federal Reserve Bank, Los Angeles, California.
9 -1951	6 -1952	Reader, correct student papers, U.C.L.A.
1947-1948-1949		Driver-mechanic, U.S.Postoffice-Christmas rush.
9 -1949	8 -1951	Student, U.C.L.A.,Geology.
9 -1947	6 -1949	Student, L.A.C.C.,Los Angeles, General Science courses in Geology, Engineering, Surveying, Physics and Chemistry.
12-1946	4 -1947	Third Officer, U.S.A.T.S.,San Francisco, California.
5 -1946	9 -1946	Third Officer, Lykes Bros.,S.S.Co.,New York, N.Y.
4 -1944	4 -1946	Cadet-Midshipman,U.S.Merchant Marine Acad.Kings Pt., New York

Applicant: Rene Engel & Associates,
1222 Blair Avenue,
South Pasadena, California.

6-Estimate of Costs.

(a) Independent Contracts.

Diamond Drilling (Size EX)6 drill locations.		
1200 ft. at $5.00 per foot		$6,000.00
Underground work (labor only)		
150 ft.Drifting and Crosscutting at $12.00 per foot	$1,800.00	
70 ft. Raising at $10.00 per foot	700.00	2,500.00
Total		$8,500.00

(b) Supervision

1 Manager and consulting engineer (R.Engel) (half time basis) (per month)	300.00	
1 Supervising resident geologist (W.C.Goth) (full time) (per month)	325.00	
	625.00	
Payroll Ded.	61.83	
	$563.17x Six months	$3,379.02

(c) Operating Materials and Supplies.

Explosives - 500 lb. 40% gel.dynamite at $24.72/%	123.60	
Explosives - 800 ft. black fuse at $2.06/%	16.48	
Explosives - 300 blasting caps at $3.09/%	9.27	$149.35
Gasoline and Oil:		
Compressor: 400 gals.gaso. at $0.25/gal.	100.00	
15 gals. motor oil at $1.00/gal.	15.00	
10 gals. compressor oil at $0.84/gal.	8.40	
Jeep: 250 gals.gaso. at $0.25/gal.	62.50	
3 oil changes,greasing and servicing at $7.50	22.50	$208.40
Timber - 5000 bd.ft. at $80.00/%.		400.00
Rails - 300 ft. - 20 lb./yard at $10.00/100 lbs.+ spikes and fish plates (total 2150 lbs.)		215.00
Galvanized steel pipe-		
200 ft. 3/4" diam. (water line)at $0.16/ foot + fittings (25%)	40.00	
200 ft. 1 1/2" diam. (air line) at $0.40/ foot + fittings (25)	100.00	140.00
		$1,112.75

(d) Operating Equipment.

1.To be purchased:		
1 Drifter with cradle bar (2nd hand)	450.00	
1 Slusher (2nd hand)	500.00	
1 Air driven fan (2nd hand)	300.00	
100 ft. canvas air duct at $1.00 per foot	100.00	
2 sets drill steel 3 pcs.each at $70.15 carboloy insert chisel bits-(new)	140.30	
1 U.V.sorting lamp (new)	170.00	
1 Motor generator, 110V 60 cycles for above (new)	200.00	$1,860.30

Applicant: Rene Engel & Associates,
1222 Blair Avenue,
South Pasadena, California.

6-Estimate of Costs. (Cont.)

(d) Operating Equipment. (Cont.)

2. Owned by applicant, use-allowance estimate:

1 Compressor (I.R. 105 cu.ft.) with Waukesha gasoline engine		
1 Mine car, 1 ton (Matteson Hendy 18 ga.)		
1 Warsop gasoline drill, with steel and tools		
Miscellaneous tools and equipment At $50.00 per month x 6	$300.00	
Engineering Equipment:		
1 Gurley transit and tripod		
1 Burger alidade, plane table and stadia board		
1Paulin altimeter		
2 U.V. portable lamps with batteries		
Drafting equipment, etc. At $25.00 per month x 6	150.00	$450.00

3. Rented

1 Jeep 1949 model at $100.00 per month x 6		600.00
Total Operating Equipment		$2,910.30

(e) Rehabilitation and repairs: None

(f) New buildings.

1. Sorting shed over ore bin, to be completed:		
500 sq.ft. corrugated steel at $0.15/sq.ft.	75.00	
Carpenter - 1 day	28.00	$103.00
2. Warehouse and Shop (20'x12'x10')		
2000 bd.ft. lumber at $75.00 (already available at mine)	150.00	
1100 sq.ft. corrugated steel at $0.15/sq.ft.	165.00	
Doors and Windoes	85.00	
Carpenter - 3 days - at $28.00/day	84.00	$484.00

(g) Miscellaneous

Assaying - 150 assays at $3.00	450.00	
Office supplies, stationery, etc. at $15.00/month x 6	90.00	
Accounting		
1 Accountant (part time) at $100.00/month		
Payroll deduction 2.50		
$97.50 x 6	585.00	
Insurance (for 6 months)		
Workmen's Compensation and Employers liability	505.00	
Liability Insurance	5,05	
Fire and Theft	22.75	$532.80
Payroll Taxes:		
Deductions	385.98	
Paid by Employer	107.28	493.26
Rental of Office and Management's living quarters $70.00/month x 6	420.00	
Living expenses and meals at $125.00/Mo. x 6	750.00	1,170.00
Total		$3,321.06

Applicant: Rene Engel & Associates,
1222 Blair Avenue,
South Pasadena, California.

6-Estimate of Costs. (Cont.)

(h) Contingencies		$189.97
Total Estimate of Costs.		
a. Independent Contracts	$8,500.00	
b. Supervision	3,379.02	
c. Operating materials and supplies	1,112.75	
d. Operating equipment	2,910.30	
e. Repairs	None	
f. New buildings	587.00	
g. Miscellaneous	3,321.06	
h. Contingencies	189.87	$20,000.00

7-(b) Applicant's share of costs:

Services: Managing and consulting (R.Engel)	$1,800.00
Use of Equipment:	$1,050.00
Money:	$2,150.00
Total	$5,000.00

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
SEP - 1 1953

MF-203

OWNER'S CONSENT TO LIEN

WHEREAS, the undersigned, as owner, ~~co-owner~~, lessor, and ~~or seller~~ has an interest in certain property in the State of California, County of Kern, described as follows:1/ 6 unpatented lode claims,as follows:

Pala No.1 or Old Andrews Tungsten,	recorded	in book	1725,p.306,
Pala No.2 or Andrews #2	"	"	1825,p.238,
Pala No.3	"	"	1987,p.3,
Pala No.4	"	"	1987,p.5,
Pala No.5	"	"	54983,(1952)
Pala No.6	"	"	54984,(1952)

of the official records of Kern Co.

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

2/ ~~Rene Engel and Associates,1222 Blair Avenue,South Pasadena,Calif.~~

hereinafter called the "Operator"; and

WHEREAS, under certain provisions of said contract which are set forth on the reverse side hereof, the Government is entitled to a percentage royalty on production and to certain other rights and equities which do or may conflict with or be adverse to the interest of the undersigned in said property;

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

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

2. To secure the payment to the Government of the percentage royalty on production3/ provided for under the terms of said exploration project contract, or any amendment thereof which does not increase the maximum amount of the Government's claim here stated or alter the provisions for repayment, there is hereby granted to the Government a lien upon the land herein described and upon any production of minerals therefrom, until the royalty claim is fully paid in the amount of the Government's contribution, not in excess of 4/$ 15,000.00----------, or ten years have elapsed from the date of the contract.

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

Dated this 29th day of July, 1953.

PALA RANCHES, Kernville, California [Seal]

by Earl V. Pascoe [Seal]

James V. Cosgrove [Seal]

1/ Either (a) insert the legal description of the land, or (b) strike out the words "as follows" and insert "in a lease [or contract, deed, or other document] dated _____, and recorded in book _____ page _____ official records of said county." If (b) is used, the book and page of recordation cannot be dispensed with. If the space provided is insufficient, use an Annex, and refer to the Annex in the space.

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

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

4/ Insert the maximum amount of the Government's contribution.

RELEVANT CONTRACT PROVISIONS

Repayment by Operator. (a) If, at any time, the Government considers that a discovery or a development from which production may be made has resulted from the exploration work, the Government, at any time not later than six months after the Operator has rendered the required final report and final account, may so certify in writing to the Operator. The certification shall describe broadly or indicate the nature of the discovery or development. In the event of such certification, any minerals mined or produced from the land described in Article 2 within 10 years from the date of this contract, including any mined or produced before the certification, shall be subject to a percentage royalty which the Operator or his successor in interest shall pay to the Government, upon the net smelter returns, the net concentrator returns, or other net amounts realized from the sale or other disposition of any such production, in whatever form disposed of, including ore, concentrates, or metal, until the total amount contributed by the Government, without interest, is fully repaid, or said 10 years have elapsed, whichever occurs first, as follows:

(1) One and one-half (1½) per cent of any such net amounts not in excess of eight dollars ($8.00) per ton.

(2) One and one-half (1½) per cent of any such net amounts, plus one-half (½) per cent such net amounts for each additional full fifty cents ($0.50) by which such net amounts exceed eight dollars ($8.00) per ton, but not in excess of five (5) per cent of such net amounts.

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

(b) As here used, "net smelter returns", "net concentrator returns", and "other net amounts realized from the sale or other disposition", mean gross revenue from sales; or if not sold, the market value, the market value of the material after it is mined in the form in which and the place where it is held. In the case of integrated operations in which the material is not disposed of as such, these terms mean what is or would be gross income from mining operations for percentage depletion purposes in income tax determination.

(c) To secure the payment of its percentage royalty, the Government shall have and is hereby granted a lien upon the land described in Article 2 and upon any production of minerals therefrom, until the royalty claim is extinguished by lapse of time or is fully paid.

(d) This article is not to be construed as imposing any obligation on the Operator or the Operator's successor in interest to engage in any mining or production operations.

Title to and disposition of property. All facilities, buildings, fixtures, equipment, or other items costing more than $50.00 each, paid for or purchased with funds contributed jointly by the Operator and the Government, although title may be taken in the name of the Operator, shall belong to the Operator and the Government jointly, in proportion to their respective contributions, and upon the completion of the work or the termination of the contract shall be disposed of promptly by the Operator for the joint account of the Government and the Operator, either by return to the vendor, by sale to others, or purchase by the Operator at a price at least as high as could otherwise be obtained, as may appear to be for the best interest of the Government, unless the Government, in writing, waives its interest in any such item. If necessary to accomplish such disposition, the Operator shall dismantle, sever from the land, and remove any such item, the cost thereof to be for the joint account of the parties in proportion to their respective interests. If the Operator, within 90 days after the receipt of written notice from the Government, fails, neglects, or refuses to dispose of such property, the Government may itself enter upon the land, take possession of, and remove and dispose of any such property as above provided.

ROOM 13, POST OFFICE BLDG.
KNOXVILLE 2, TENN.

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

OFFICIAL BUSINESS

PENALTY FOR PRIVATE USE TO AVOID
PAYMENT OF POSTAGE, $300
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Mr. George C. Selfridge, Chairman
Operating Committee - D M E A
Dept. of the Interior
Washington 25, D. C.

400 FILE COPY
SURNAME:

Martin

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

MAR 27 1953

Mr. Hans Engl
1222 Blair Avenue
South Pasadena, California

Dear Mr. Engl:

Your request to Mr. V. A. Brussolo of the Defense Materials Procurement Agency for information concerning exploration assistance has been referred to the Defense Minerals Exploration Administration for reply.

The United States Government grants assistance to individuals for the exploration of strategic minerals on a participating basis under the rules and regulations set forth in the attached mineral order DMEA Order-1. Certain sections of the order are explained more fully in the "Questions & Answers" booklet included herewith.

In the case of tungsten, the Government will participate to a maximum of 75 percent of the estimated exploration cost on approved projects, the money to be repaid from income on future production.

If you are interested in participating in this program, it is suggested that you complete in detail and return four of the attached copies of Form MF-103 to us. If you require advice in preparing the application, please communicate with Mr. H. C. Miller, Executive Officer, DMEA Field Team, Region III, 1012 Flood Building, 870 Market Street, San Francisco 2, California.

Sincerely yours,

C. O. Mittendorf (for)

Administrator

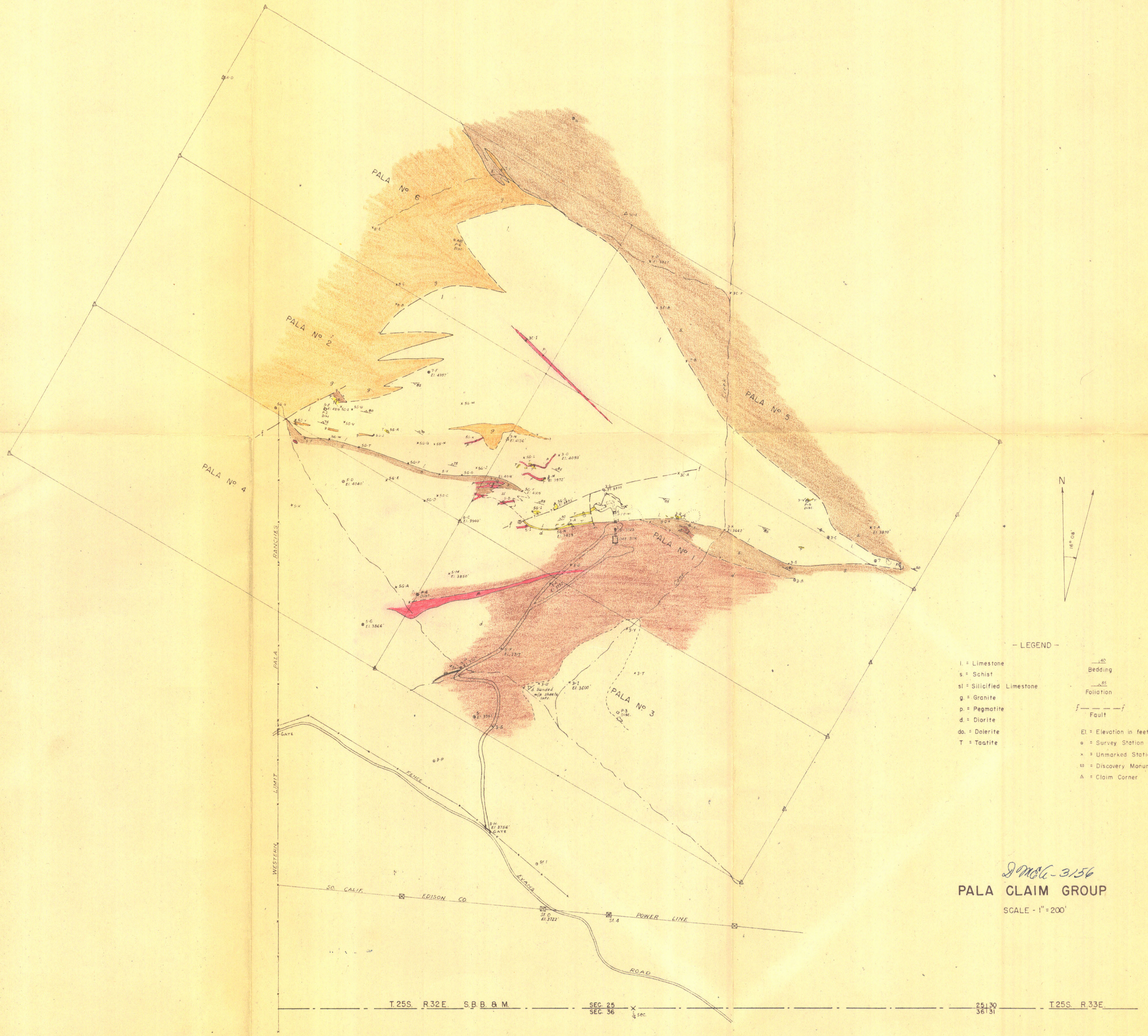
J.N.
3/27/53

Enclosures

CC: Mails & Files
CODE 400
ADMN. READ. FILE
MR. V. A. BRUSSOLO, RM. 7006, GSA BLDG. - DMPA
FIELD TEAM, REGION 3

WSMartin/ls
3/27/53

LEGEND
l LIMESTONE - MARBLE
sl SILICIFIED LIMESTONE
S SCHIST & GNEISS
€ SANDSTONE BANDS IN LIMESTONE
d DIORITE
do DOLERITE & LAMPROPHYRE DIKES
g GRANITE
P PEGMATITE DIKES
T TACTITE ± SCHEELITE
Wo WOLLASTONITE
Ca CALCITE
gn GARNET
to TOURMALINE
q QUARTZ
MAP SYMBOLS
G 56
SURVEY STATION
35
FOLIATION
65
JOINT
FAULT
CONTACT
3.5'
ASSAY VALUE WO3 %
& THICKNESS OF ORE
WASTE DUMP
CANE CREEK
DMEA-3156
PALA TUNGSTEN
SCALE: 1" = 40'
July 30, 1953



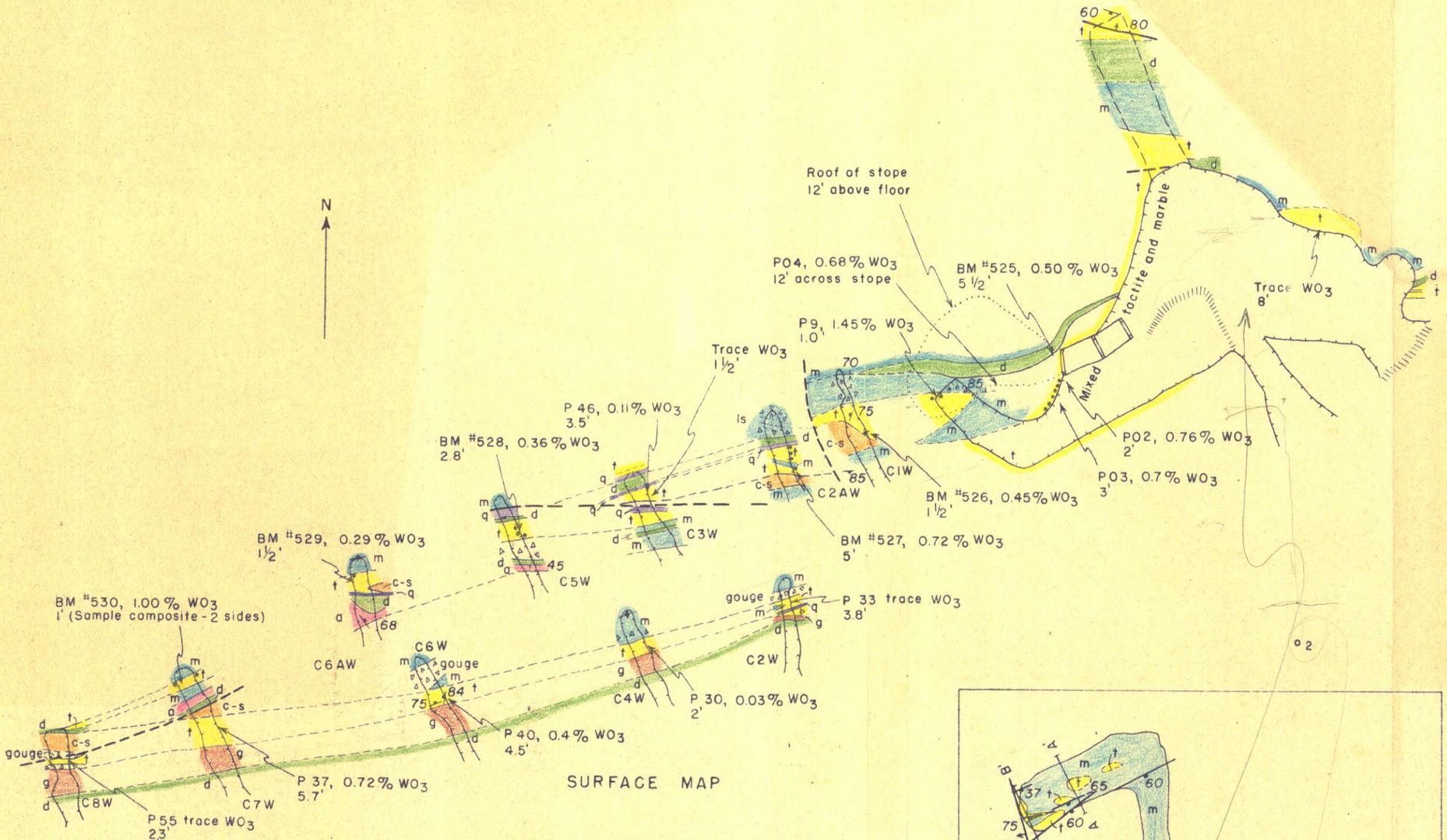
DMEC-3156

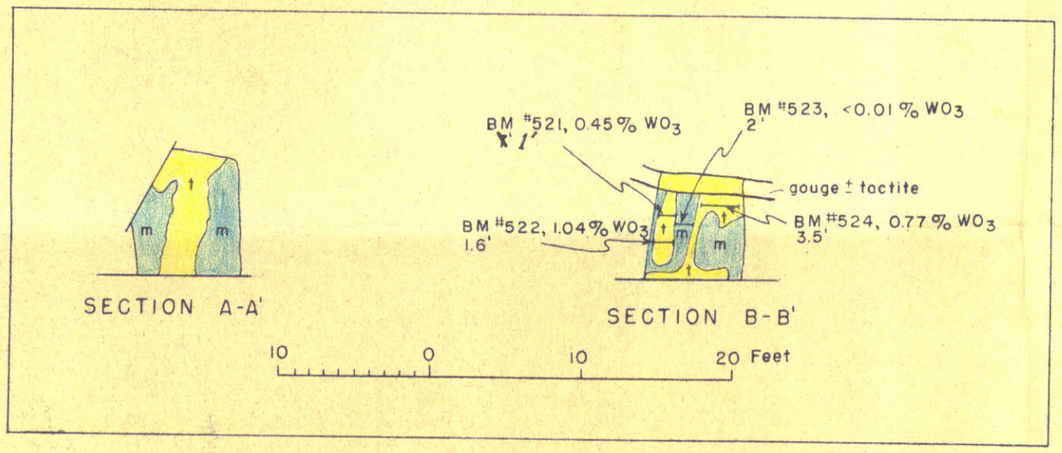
PALA CLAIM GROUP

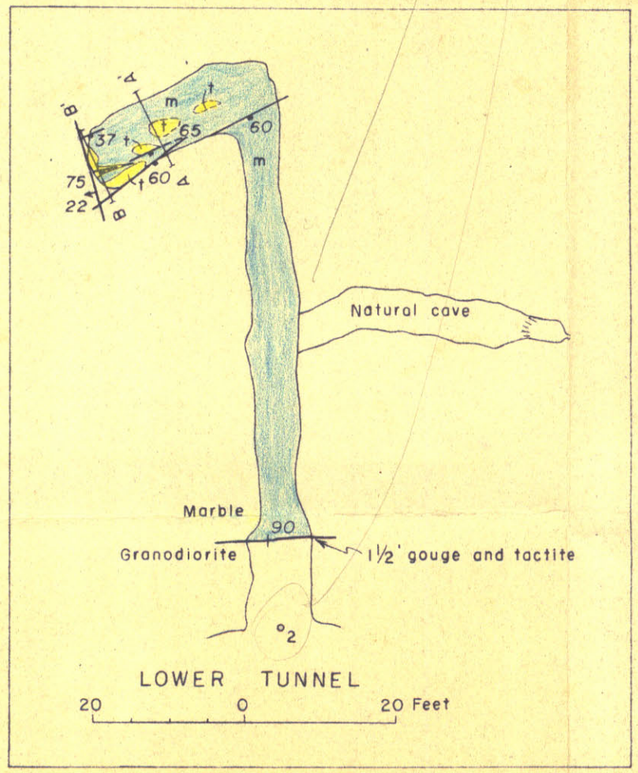
SCALE - 1" = 200'

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

DMEA 3156
(Tungsten)







EXPLANATION

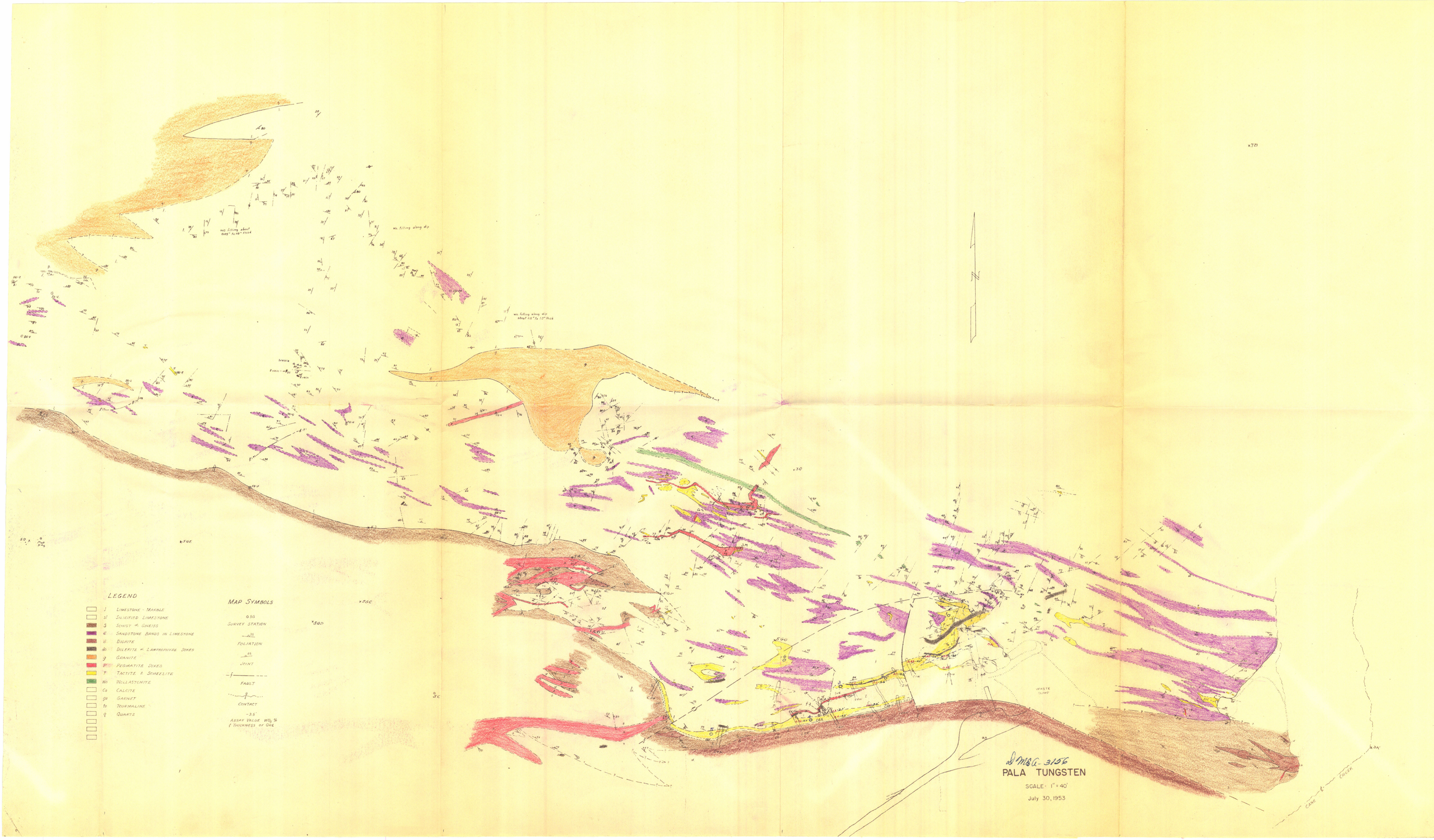
- m — Marble
- t — Tactite, dark colored, with garnet, epidote, and scheelite
- g — Granulite
  Hybrid diorite
- a — Aplite
- c-s — Calc-silicate, light colored, with wollastonite or tremolite
- d — Greenish gray dolerite dike or calc-silicate beds
- q — Quartzite
- Gouge and breccia
- Scheelite in tactite
- 60 — Contact, showing dip
  Dashed where approximately located
- 90 — Vertical fault
  Dashed where approximately located
- 85 — Strike and dip of foliation
- 75 — Strike and dip of joints
- Outline of underground workings
- P9 — Operators samples
- BM #526 — DMEA samples
- Open cut

After Company maps

PALA TUNGSTEN MINE, KERN COUNTY, CALIFORNIA

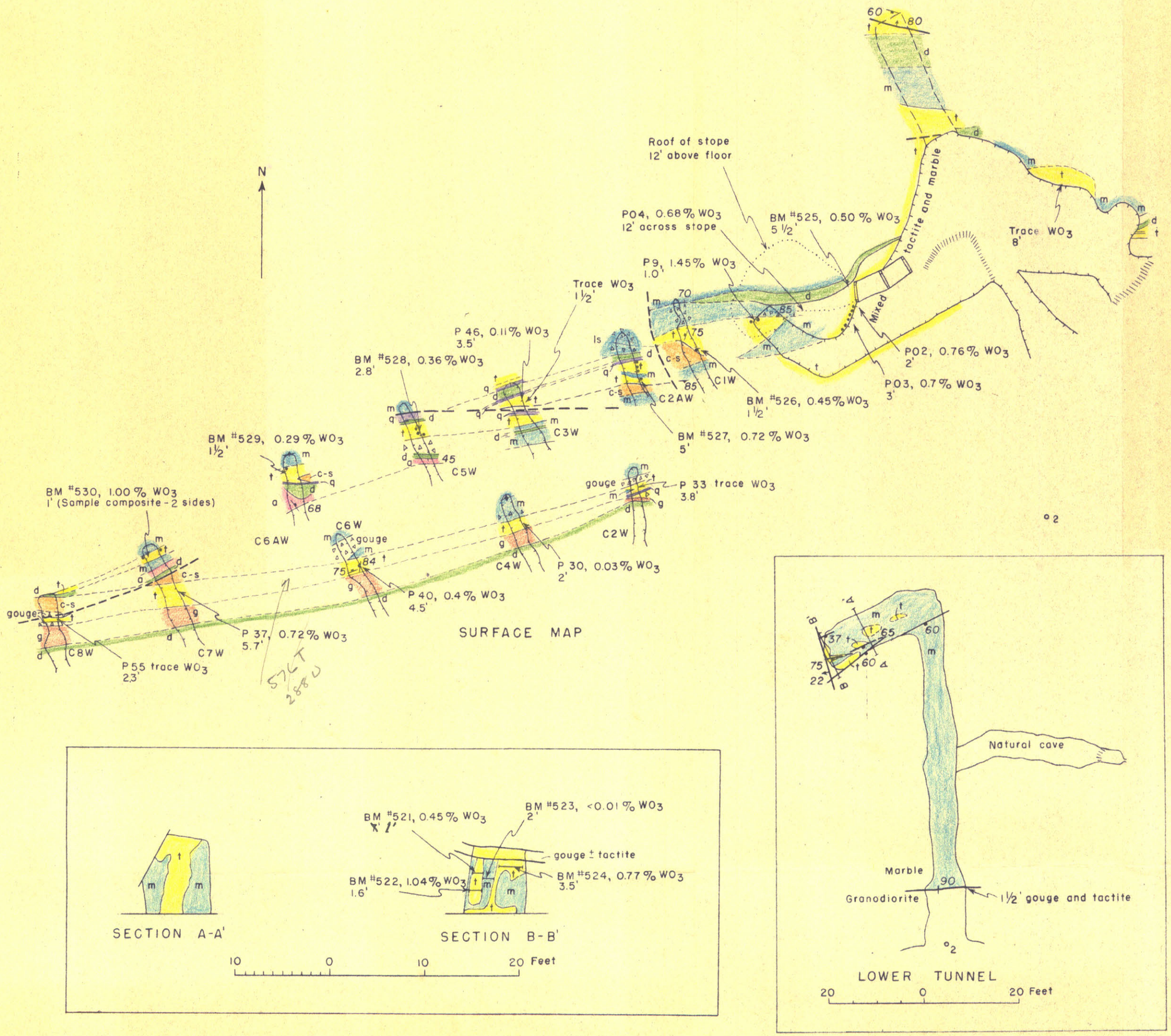
20 0 20 40 Feet

Figure 2.


LEGEND
l LIMESTONE - MARBLE
sl SILICIFIED LIMESTONE
S SCHIST & GNEISS
€ SANDSTONE BANDS IN LIMESTONE
di DIORITE
do DOLERITE & LAMPROPHYRE DIKES
g GRANITE
p PEGMATITE DIKES
T TACTITE & SCHEELITE
Wo WOLLASTONITE
Ca CALCITE
Gn GARNET
To TOURMALINE
q QUARTZ
MAP SYMBOLS
0.5G
SURVEY STATION
25
FOLIATION
85
JOINT
FAULT
CONTACT
-3.5'
ASSAY VALUE WO3 %
(THICKNESS OF ORE
wo. filling about 0.05" to 0.10" thick
wo. filling along dip
wo. filling along dip about 0.5" to 1.0" thick
breccia
WASTE DUMP
N
PALA TUNGSTEN
SCALE- 1" = 40'
July 30, 1953

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

DMEA 3156
(Tungsten)



EXPLANATION

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After Company maps

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20 0 20 40 Feet

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