JUL 1 1953

Mr. Bill C. Dyer
Trinity Exploration Company
P. O. Box 992
Silver City, New Mexico

Re: Docket No. DMA 2954 - Nickel, Cobalt, and Uranium
Trinity Exploration Company
(Bill C. Dyer & Ernest A. Mehrer, Jr.)
Alhambra Mine
Grant County, New Mexico

Dear Mr. Dyer:

Your application for aid for an exploration project and other data available to us in Washington concerning the above-noted 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, although noting that cobalt and nickel minerals were said to occur in the Alhambra Mine and that pitchblende has been found on some of the Alhambra dumps and the dumps are in part radioactive, indicates to us that the probability of disclosing minable ore reserves by your proposed program is not sufficiently promising to justify Government participation. We regret to advise you, under these circumstances, that your application for exploration assistance is denied.

This denial is made without prejudice to the property. If at some future date the underground workings are accessible for examination and more favorable data can be presented to substantiate the probability of an occurrence of uranium, cobalt, and nickel, we will be glad to consider a revised application for exploration assistance. The revised application should refer to the present docket.

We wish to thank you for your interest in the Defense Minerals Program and for bringing your property to our attention. Please be assured that a revised application containing the necessary information will be given prompt consideration.

Sincerely yours,

C. O. Mittendorf

Administrator

Copy to: Mr. A. P. Butler, Jr., USGS, Rm. 3206 GSA Bldg.
Mr. H. D. Keiser, USBM, Rm. 3641
Mr. J. O. Hosted, A. E. C., Rm. 3212, GSA Bldg.
Mr. H. W. Davis, USBM, Rm. 3519
Mr. T. P. Thayer, USGS, Rm. 4207 GSA Bldg.
Mr. Ernest W. Ellis, DMEA, Rm. 4640

Docket
Adm. Read. File
Code 400
Operating Committee

FARutledge/ls
6/30/53

Code 400

E. Wm. Ellis, DMEA Member
Uranium Commodity Committee
Arthur P. Butler, Jr., USGS Member, Uranium Commodity Committee

July 1, 1953

Field team final report, DMEA Docket 2954 (Nickel-Cobalt-Uranium), Trinity Exploration Company, Alhambra Mine, Bullards Peak Mining District, Grant County, New Mexico.

I have reviewed the Field Team report on the property identified in the subject above, and have discussed it with Mr. H. D. Keiser, Bureau of Mines member of the Commodity Committee.

Proposal

The applicant proposes to explore for cobalt-nickel-uranium ore by rehabitating some of the old workings of the Alhambra Mine, Bullards Peak Mining District, Grant County, New Mexico. The first phase would be reclaiming of the shaft and dewatering the mine, preparatory to drifting in the vein.

Comment

There is considerable difference of opinion as to the advisability of this loan. The geologists recommend that it be granted, the mining engineers, that it be denied. The field team recommends denial, but also recommended that the applicant be notified that the DMEA would consider without prejudice a revised exploration program at some later date when the underground workings would be available for examination.

In the final analysis the reasons advanced for granting the loan are based on the geological work of Elliot Gillerman, who has mapped and studied the area in detail and has pointed out the similarity of the vein in the area with those at Joachimsthal, Czechoslovakia, and Great Bear Lake, Canada, which have produced important quantities of pitchblende. On Gillerman's recommendation the Black Hawk vein in the Bullards Peak district, which is near and similar to the Alhambra vein, was explored by three diamond-drill holes in 1952. The report on the drilling has not been completed, but it is known that the results were negative so far as uranium is concerned. (It will be noted that the recommendation mentions the work at Black Hawk, DMEA 967X, but does not give the results). It appears, however,

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that the drilling was based in part on an old map which may not have been accurate, and the holes may conceivably have missed the vein for that reason.

Both the Black Hawk and Alhambra veins are of much geologic interest, being among the few veins of their type in the United States, and their exploration might yield considerable useful scientific information, which can hardly be obtained by drilling alone, but would require examination of the mines, possibly coupled with some drilling. On the other hand, a study of the reports leads to the conclusion that it is most unlikely that the property will produce any significant amount of uranium, cobalt, or nickel.

Recommendation

In view of the many unknown factors involved in the proposed exploration, which lead to the conclusion that there is little likelihood of any large production from the mine, I concur with the Field Team's recommendation that the application be denied. I also concur in their recommendation that the applicant be notified that the DMEA would consider without prejudice a revised exploration program to be submitted when the underground workings would be accessible for examination.

Arthur P. Butler, Jr.

Copy to: E. Wm. Ellis (2)

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUN 30 1953

June 30, 1953

402

Memorandum

To: Ernest William Ellis, DMEA Member
Uranium Commodity Committee, Room 4640

From: H. D. Keiser, Bureau of Mines Member
Uranium Commodity Committee

Subject: Field Team Report, DMEA Docket 2954, Trinity Exploration Co., Alhambra Mine, Bullards Peak Mining District, Grant County, New Mexico.

I have reviewed the subject report and discussed it with Andrew Brown, Acting Geological Survey Member, and Joseph O. Hosted, representative of the Atomic Energy Commission.

It is recommended that the subject report be approved, and that the application for an exploration loan be denied.

The report has been forwarded to the Chief, Minerals Division, Bureau of Mines, in accord with the routing slip attached thereto.

Signed

H. D. Keiser

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June 30, 1953

MEMORANDUM

To: Administrator, DMEA

From: Iron and Ferro-Alloys Division, DMEA

Subject: Denial of exploration project in the amount of $32,500.00
Docket No. DMEA 2954 - Nickel, Cobalt, and Uranium
Trinity Exploration Company
(Bill C. Dyer and Ernest A. Schroer, Jr.)
Alhambra Mine
Grant County, New Mexico

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

(1) The applicants proposed to unwater and rehabilitate the workings of the old Alhambra Mine and ascertain if nickel, cobalt, and uranium mineralization is present in appreciable quantities. When informed that DMEA did not favor straight dewatering and rehabilitation projects, the applicants added new exploration, consisting of shaft sinking, drifting, and raising, to the proposed project. The new exploration was to depend upon finding significant mineralization in the old workings.

(2) Nickel, cobalt, and uranium minerals occur with silver in the Black Hawk mining district in veins occupying relatively narrow, persistent fractures in metamorphic granites. The vein material consists primarily of manganiferous and ferruginous carbonates, with which are associated very small amounts of simple sulfides and several uncommon minerals containing cobalt and nickel. Native silver and silver sulfides are found in all the veins and pitchblende has been reported from the Black Hawk and Alhambra mines. Shipments of ore assaying as high as 1,500 ounces of silver are reported from the district.

The silver and associated nickel, cobalt, and uranium occur in small but rich ore shoots.

(3) The Alhambra mine is said to have produced more than $300,000.00 in silver between 1881 when the vein was discovered and 1893 when operations ceased because of adverse economic conditions. As the nickel, cobalt, and uranium occur with the silver, these metals were lost in recovering the silver.

(4) The applicants plan to explore an area roughly equivalent to an area of the mine where less than 1,000 tons of ore are estimated to have been mined. There is no reason to expect better conditions with the new exploration than those shown by former mining. This amount of ore, even if high in nickel, cobalt, and uranium, would not constitute a significant discovery.

(5) As all of the ore minerals seem to occur in close relationship, a treatment plant must be erected or the ore shipped long distances to treatment plants so that the nickel, cobalt, and uranium could be separated. The temptation would be to ship rich silver ores, if encountered, to a nearby smelter, thus depriving the Defense Program of nickel, cobalt, and uranium, the basis of the proposed project.

(6) The Alhambra vein is the second largest vein in the district and the second largest producer of silver. The largest vein, the Black Hawk, was the object of an exploration contract for uranium -- Docket No. DMA 967X, Contract No. Idm-E289. This project was completed in November 1952 with negative results.

(7) The Geological Survey members of the examining field team half-heartedly recommended an exploration project. One member believed the project was warranted on the basis of the pitchblende occurrence and Gillerman's (Trace Elements Division, Geological Survey) belief that the Alhambra vein was one of the best potential sources of nickel-cobalt-uranium ore in the Black Hawk district. Gillerman also recommended the Black Hawk project.

The other member of the Survey party believes the vein and the ore shoots within it are too small to justify further exploration.

(8) The Bureau of Mines member of the examining field team recommended denial of the application.

(9) The Field Team recommends denial.

(10) The Commodity Divisions of the Bureau of Mines and Geological Survey concur in the denial.

It is further recommended, in the event that the applicant dewaters the old workings on his own account and then submits a revised application for exploration assistance, that the primary consideration be the uranium, rather than the nickel or cobalt.

Copy to: Docket
Adm. Read. File
Code 400
Code 700 - Mr. Ellis

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

FARutledge/ls 6/30/53

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

402

224 New Customhouse
Denver 2, Colorado

Denial recom

June 19, 1953.

Memorandum

To: Secretary to the Operating Committee, Defense Minerals Exploration Administration.

From: Field Team, Region IV

Subject: Final Report, DMEA Docket 2954 (Nickel-Cobalt-Uranium), Trinity Exploration Company, Alhambra Mine, Bullards Peak Mining District, Grant County, New Mexico.

Enclosed are the original and three copies of the final report on Docket No. DMEA-2954.

The proposed exploration consisted of unwatering and rehabilitating the underground workings of the old Alhambra Mine so that they could be sampled. The estimated cost of the work was $32,500.00. The applicant was notified that his proposal did not constitute exploration work. He then submitted a revised application that included shaft sinking, drifting and raising as well as the original proposal.

The mine has not been operated since 1893. It was essentially a silver mine. The underground workings are not accessible and old maps furnished by the applicant are probably incomplete. Assays are not given; however, small amounts of radioactive material have been found on the surface.

The Field Team believes that the proposed exploration will not produce a significant amount of uranium, cobalt or nickel. It is recommended that this application for exploration assistance be denied and that the applicant be notified that the DMEA would consider without prejudice a revised exploration program at some later date when the underground workings would be accessible for examination.

W. H. King
W. H. King

W.H.K.

A. H. Koschmann
A. H. Koschmann

Enclosures

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Mr. Bill C. Dyer
Trinity Exploration Company
P. O. Box 992
Silver City, New Mexico

APR 16 1953

Re: Docket No. DMA 2958 - Nickel, Cobalt, and Uranium
Trinity Exploration Company
(Bill C. Dyer & Ernest A. Schroer, Jr.)
Alhambra Mine
Grant County, New Mexico

Dear Mr. Dyer:

This will acknowledge receipt of your application for assistance in exploring for nickel, cobalt, and uranium at the Alhambra mine. After a review by the Iron and Ferro-Alloys Division of the Defense Minerals Exploration Administration, the subject application has been referred to Mr. A. H. King, Executive Officer, DMEA Field Team, Region IV, 224 New Customhouse Building, Denver 2, Colorado, for a review and possibly a field examination.

Should a field examination be required, any assistance that you can render the examining engineers will be appreciated.

Sincerely yours,

C. O. Mittendorf

Administrator

cc: Docket
Field Team, Region 4
Code 400
Adm. Read. File
H. W. Davis, USBM
T. P. Thayer, USGS

FAHutledge/hhb
4/9/53

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APR 16 1953

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Mr. W. H. King, Executive Officer
DMEA Field Team, Region IV
224 New Customhouse Building
Denver 2, Colorado

Re: Docket No. DMEA 2952 - Nickel
Cobalt, and Uranium
Trinity Exploration Company
(Bill C. Dyer & Ernest A. Schroer, Jr.)
Alhambra Mine
Grant County, New Mexico

Dear Mr. King:

Reference is made to the subject application for exploration assistance which is being referred to your office for review and possibly a field examination if an examination is warranted.

The exploration program presented by the applicant is not acceptable to the Defense Minerals Exploration Administration because the only work outlined is dewatering the old workings and sampling. A program of this type could be approved only as Stage I of a more comprehensive exploration project.

We have not requested additional information from the Operator, however, because we feel that the Field Team is in a better position to consider the subject application and discuss the project with the applicants. The exploration project should be evaluated with consideration for the results obtained at the adjacent Black Hawk mine and the recent detailed geologic study of the district by the U. S. Geological Survey.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee

APPROVED:

J. H. Hedges

Member, Bureau of Mines

A. R. Kinkel, Jr.

Member, Geological Survey

Copy to: Docket
Field Team, Reg. 4
Admr. Asst. File
Code 400
H. W. Davis, USGS
T. P. Thayer, USGS

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

C O P Y

224 New Customhouse
Denver 2, Colorado

June 19, 1953.

Memorandum

To: Secretary to the Operating Committee, Defense Minerals Exploration Administration.

From: Field Team, Region IV

Subject: Final Report, DMEA Docket 2954 (Nickel-Cobalt-Uranium), Trinity Exploration Company, Alhambra Mine, Bullards Peak Mining District, Grant County, New Mexico.

Enclosed are the original and three copies of the final report on Docket No. DMEA-2954.

The proposed exploration consisted of unwatering and rehabilitating the underground workings of the old Alhambra Mine so that they could be sampled. The estimated cost of the work was $32,500.00. The applicant was notified that his proposal did not constitute exploration work. He then submitted a revised application that included shaft sinking, drifting and raising as well as the original proposal.

The mine has not been operated since 1893. It was essentially a silver mine. The underground workings are not accessible and old maps furnished by the applicant are probably incomplete. Assays are not given; however, small amounts of radioactive material have been found on the surface.

The Field Team believes that the proposed exploration will not produce a significant amount of uranium, cobalt or nickel. It is recommended that ~~this application for exploration assistance be~~ denied and that the applicant be notified that the DMEA would consider without prejudice a revised exploration program at some later date when the underground workings would be accessible for examination.

Reviewed by
DMEA OPERATING COMMITTEE
6-26-53
(date)

/s/ W. H. KING
W. H. King

/s/ A. H. KOSCHMANN
A. H, Koschmann

Enclosures

Area 2954

Field Team
Report &
Maps

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Mining Division
Region IV

June 18, 1953.

Memorandum

To: Field Team, Region IV

From: Chief, Mining Division, Region IV

Subject: Final Report, Docket DMEA 2954 (Nickel-Cobalt-Uranium), Trinity Exploration Company, Alhambra Mine, Bullards Peak Mining District, Grant County, New Mexico.

Enclosed are the original and eight copies of an engineering report on Docket DMEA 2954.

The original application consisted of unwatering and rehabilitating the underground workings of the old Alhambra Mine so that they could be sampled. As this did not constitute exploration work, the applicant submitted a revised application which included sinking, drifting and raising.

The mine has not been operated since 1893 and it is doubtful if the maps are complete. No assays are given but small amounts of radioactive material have been found on the surface.

Because very little is known of the underground workings, and because there is little likelihood of a significant amount of uranium, nickel or cobalt being discovered as a result of the proposed exploration, we agree with the examining engineer that this application be denied.

W. H. King
W. H. King

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE
6-26-53
(date)

MINING DIVISION
REGION IV

June 3, 1953

Memorandum

To : W. H. King, Chief, Mining Division, Region IV

From : Chief, Mining Methods Br., Mining Div., Region IV

Subject : Report on Docket DMEA-2954, Trinity Exploration Co.'s Alhambra Mine, Bullards Peak Mining District, Grant County, N. Mex. (Nickel-Cobalt-Uranium).

Enclosed are original and 8 copies of an Engineering Report by John A. Soule' of the Bureau of Mines. A separate report will be submitted by the Geological Survey as the Bureau and Survey cannot agree on the recommendations.

The applicant originally asked for DMEA funds to reopen, unwater and rehabilitate the main shaft and underground workings of the old Alhambra mine so they could be sampled. As this did not constitute exploration work as defined by DMEA, the applicant was asked to amend his original application. He then submitted a new application where shaft sinking, drifting and raising were added.

In 1948 and 1949, I consulted the owners of the Alhambra property and visited the mine on two different occasions. The only underground map was one that the owners had obtained years before. This map evidently has been used by the applicant for his proposed work. Whether or not it is a true map of the mine, no one can say.

As in the old Black Hawk mine, (DMEA-967A) which is a short distance east or northeast of the Alhambra, too much credence is placed upon old maps which cannot be checked. No underground assays are shown and the only reason for recommending this proposed exploration work is that small amounts of radioactive material have been found on the surface.

cc W. H. King (8)
R. F. Robinson
DMEA-2954
DF

WHStorms:frj

Reviewed by
DMEA OPERATING COMMITTEE
6-26-53
(date)

Because of the fact that there are too many unknown factors in this application, we recommend that the loan be denied. As the Geological Survey intends to recommend a loan, we are submitting this separate Engineering Report.

Brochure will be submitted by the Survey.

Lincoln A. Stewart

Lincoln A. Stewart, Mining Engineer
For Walter R. Sterns, Chief
Mining Methods Branch
Mining Division, Region IV

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

200 New Customhouse
Denver 2, Colo.

June 10, 1953

Memorandum

To: DMEA Field Team, Region IV

From: A. H. Koschmann

Subject: DMEA Docket 2954, The Alhambra Mine (Dyer and Schroer), Grant County, New Mexico, Uranium

Enclosed are 11 copies of the geologic report by John H. Faick and Raymond F. Robinson of the U. S. Geological Survey covering the above docket.

It has been recommended that the loan be approved.

A. H. Koschmann
A. H. Koschmann
Supervising Geologist
Colorado-Wyoming

Enclosures (11)

Reviewed by
DMEA OPERATING COMMITTEE
6-26-53
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
P.O.Box 4126, University Station
Tucson 5, Arizona

June 8, 1953

Memorandum

To: A. H. Koschmann, Denver, Colorado

From: Raymond F. Robinson, Tucson, Arizona

Subject: DMEA 2954, The Alhambra Mine (Dyer and Schroer), Grant County, New Mexico, Uranium

Enclosed are the original and 10 copies of the final geologic report on the subject docket in which the U. S. Geological Survey members of the examining team recommend that an exploration loan totalling $44,940 be granted the applicant.

It is felt that there is a good possibility that unknown quantities of cobalt-nickel-uranium-silver-bearing ore have been left in the mine by past producers. Therefore, the recommendations for the loan are made primarily to permit the evaluation of the uranium and secondarily the cobalt nickel content of the veins.

The U. S. Bureau of Mines did not participate in the examination but will submit a report covering costs and advocating denial on the basis that insufficient data exists to properly evaluate the project.

The recommendations for approval are based on the following facts:

Mr. Elliot Gillerman, who has made an intensive study of the area and the mines therein for the Atomic Energy Commission, feels that one of the best chances for finding a pitchblende deposit exists at the Alhambra Mine.

2. The mineralogical associations here are favorable for extensive occurrence of the mineral as suggested by world-wide comparisons of uranium deposits.

3. Pitchblende has been positively identified in the Alhambra ore and the mine workings and dumps are radioactive.

Reviewed by
DMEA OPERATING COMMITTEE
6-26-53
(date)

4. The mine has apparently not been worked out and the cobalt-nickel-uranium type of ore was of no interest to past producers because of low silver content.

5. The applicant is sincere, cooperative, reasonable and capable of conducting the proposed program.

6. Success on this project will have far-reaching effects and the district may produce considerable amounts of the sought after metals.

No reliance has been placed on any of the old maps made available to us. The applicant's map was checked and found absolutely correct as to surface detail but is classed as unreliable as to sub-surface details. The brochures are enclosed.

Raymond F. Robinson

Raymond F. Robinson
Acting District Supervisor
Arizona-New Mexico

Enclosures 13

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMEA-2054, Trinity Exploration Company's Alhambra Mine

Bullards Peak Mining District, Grant County, New Mexico

(Nickel-Cobalt-Uranium)

June 1953

Reviewed by
DMEA OPERATING COMMITTEE

6-26-53
(date)

THE ALHAMBRA MINE
GRANT COUNTY, NEW MEXICO
RMEA 2954

URANIUM

Geology

By
John W. Faick and Raymond F. Robinson
Geologists, U. S. Geological Survey

THE ALHAMBRA MINE
GRANT COUNTY, NEW MEXICO
NMBA 2954

URANIUM

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SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Several narrow fissure veins containing nickel-cobalt-uranium-silver ore are present in the Black Hawk district, where they occur in pre-Cambrian gneissoid granite. These veins are similar in character to veins at Great Bear Lake, Canada and a few other places, and they represent a vein type that has supplied most of the pitchblende mined throughout the world. The veins in the Black Hawk district have been mined exclusively for high-grade silver ore, but the presence of nickel, cobalt, and uranium is well established.

The largest vein, the Black Hawk, has previously been explored with assistance from the Defense Minerals Exploration Administration, and exploration of the Alhambra vein, the second largest, is now being proposed. Because the Alhambra mine is largely inaccessible and available maps and reports are not reliable the proposed exploration must be evaluated largely on the basis of district-wide studies made by Elliot Gillerman for the Trace Elements Division of the U. S. Geological Survey and for the Atomic Energy Commission.

Gillerman called attention to the similarity of these veins to those which have produced notable quantities of pitchblende in other parts of the world. The similarity of mineralization suggests that significant deposits of uranium, nickel, and cobalt might be found in the Black Hawk district, although it is not expected that very large deposits will be encountered.

The Alhambra mine is recommended for exploration with DMEA assistance because of the possibility that uranium ore might be discovered in sufficient amounts to be important to the defense effort, and because DMEA aid would indirectly encourage exploration for nickel-cobalt-uranium ore in other parts of the Black Hawk district.

INTRODUCTION

The Alhambra Mine, Black Hawk District, near Silver City, New Mexico, was examined May 27, 1953, by R. F. Robinson and J. H. Faisk, Geologists, U. S. Geological Survey. The examination was made on behalf of the Defense Minerals Exploration Administration which is in receipt of an application, DMA 2954, for financial aid in exploring the Alhambra Mine for cobalt, nickel, and uranium. The total cost of the exploration project is estimated by the applicant to cost $44,960.00, of which the Government's share will be $40,446.00.

Most of the old workings of the Alhambra Mine are caved, filled, or full of water, and are accessible only to depths of 40 feet or less. Little can be learned of the mine by examination of the accessible workings, or by examination of the old dumps; therefore, an appraisal of the property can only be made mainly by using data obtained from Elliot Gillerman, who has studied the Black Hawk district for the Reconnaissance Unit of the U. S. Geological Survey, on behalf of the Raw Materials Division of the Atomic Energy Commission. Gillerman has also studied and reported upon the Black Hawk mine, in the same district, which has explored for cobalt, nickel, and uranium ore with Government aid as project DMA 967X. Data made available to this writer by Gillerman has been relied upon to a large extent. The conclusions expressed in this report are similar to those expressed in his report on the Black Hawk Mine, DMA 967X. Published data collected and submitted by the applicant and old unreliable maps have been reviewed and proved interesting but no firm credence is placed on them.

GENERAL GEOLOGY

The Black Hawk mining district is within a large mass of pre-Cambrian crystalline rocks that crop out over about 400 square miles in western Grant County, New Mexico, and extends from south of the Burro Mountains to north of the Gila River. The southern extremities of the mass are overlain by Tertiary and Recent gravels and the northern part is overlain by Tertiary volcanic rocks. In the Black Hawk district the dominant rock is a coarse-grained, dark colored gneiss, which is intruded by pink granite, quartz diorite, monzonite porphyry, and rhyolite.

The gneiss, which is the main host rock for the ore, is a dark coarsely-porphyritic rock with big pink feldspar crystals and a groundmass of dark biotite. The rock contains fragments of pre-Cambrian schist, and is cut by a network of pale pink aplites which grade into quartz feldspar pegmatites. The rock is probably the metamorphic equivalent of the coarse-grained granites found to the south in the Burro Mountains.

The medium-grained pink granite intrudes the gneiss and is probably also of pre-Cambrian age. It crops out extensively south of the Black Hawk Mine.

A large body of monzonite porphyry intrudes the gneiss, and possibly also the pink granite. This rock forms the two prominent hills known as Twin Peaks near the west side of the district. Small spurs and dikes of this intrusive occur near the mines. The monzonite porphyry may be related to similar rocks in the Silver City, Santa Rita-Hanover and Tyrone districts, and if so, may be late Cretaceous or early Tertiary in age.

Dikes of quartz diorite cut the gneiss, and dense white rhyolite dikes cut the gneiss and granite.

Within the Black Hawk mining district, there are many narrow veins that contain silver, cobalt, nickel, and uranium. Several of these were actively exploited prior to 1893 for their relatively high content of silver, and to a very minor extent for cobalt and nickel. Total production, which is reported to be between $1,000,000 and $1,500,000, was obtained principally from the Black Hawk, Alhambra, Hobson, and Rose mines in about the same order of importance. Nearly all of the production has been high grade silver ore, and shipments as high as 15,000 ounces of silver per ton are reported.

The Black Hawk mine, which produced ore valued at about $600,000 was exploited to a depth of about 750 feet. The Alhambra mine, which produced ore valued at about $400,000, was explored to a reported depth of about 500 feet and intensively mined to a depth of about 300 or 400 feet according to old records. The Old Rose mine was exploited to a depth of 200 feet and is reported to have produced $150,000 in silver. A small production was obtained from the Hobson mine from workings reported to be about 200 feet deep.

All of the known veins in the Black Hawk district are remarkably similar in character. The veins occupy relatively narrow, persistent fractures in metamorphic granites and consist of abundant manganiferous and ferriginous carbonates with which is associated very small amount of simple sulfides and several uncommon minerals containing cobalt and nickel. Native silver and silver sulfides were found in all the veins and pitchblende has been reported from the Black Hawk and Alhambra mines. A relatively small amount of quartz, chert, and jasper is associated with the vein material. A characteristic feature of the deposits is a narrow zone of reddish, hematitic or limonitic alteration that apparently is closely associated with mineralization.

Minerals known to occur in the Black Hawk district are as follows:

Gangue Minerals

Quartz	Siderite
Calcite	Rhodochrosite
Dolomite	Barite

Minor Sulfides

Pyrite	Sphalerite
Chalcopyrite	Galena
Tetrahedrite	

Ore Minerals

Native silver	Chloanthite
Argentite	Niccolite
Erythrite	Skutterudite
Smaltite	Pitchblende-uranium oxide
Cobaltite	Millerite
Garnierite	

Weathering Products

Limonite	Pyrolusite

Oxidation of the veins is not intense and apparently not very deep as sulfide minerals have been found very near the surface and there is little evidence of intensive leaching or alteration. Small amounts of limonite have developed by weathering of siderite and other ferrous minerals and pyrolusite has developed by weathering of manganiferous calcite. Erythrite, which was previously reported but not seen by the examiners, is undoubtedly of supergene origin and the same is true for garnierite (?).

Gillerman[1] has called attention to the similarity of the mineral assemblage in the veins of the Black Hawk District to the mineralogy in the veins at Joachimstahl, Czechoslovakia, and to Great Bear Lake, Canada. The similarity of the veins to those at Johanngeorgenstadt, Czechoslovakia,

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1/ Gillerman, E., The Black Hawk Mine, Grant County, New Mexico, DMA 967X, 1951, p. 7.

has been noted[2] and the vein type has previously been described by Bastin.[3]

Mineral deposits of the type mentioned are generally characterized by a very high percentage of carbonate gangue with which is associated a varied mineral assemblage including base-metal sulfides, cobalt-nickel minerals, and native silver. Uranium is but a minor component in these veins, although it has been stated[4] that most of the world's pitchblende ore has been produced from deposits containing a variety of metallic minerals.

DESCRIPTION OF THE ALHAMBRA DEPOSIT

The Alhambra vein (see fig. 4) lies about 3000 feet southwest of the Black Hawk mine which was previously explored by diamond drilling with DMEA assistance. The Alhambra vein strikes about N. 15° W. and dips about 80° SW. It has been explored and developed throughout a strike length of about 550 feet, and at one place to a reported maximum depth of 500 feet. Total production is estimated at $400,000 in silver, most of which was produced from 1881 when the vein was discovered to 1893 when operations ceased because of adverse economic conditions.

The old mine workings are accessible only to depths of about 40 feet, therefore in evaluating the mine, some reliance must be placed upon old newspaper accounts, private reports, and some old maps that are probably incomplete. The vein is exposed in a shallow shaft near the Carr Tunnel, and

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2/ Everhart, D. L. and Wright, R. J., The Geologic Character of Typical Pitchblende Veins, Econ. Geol., vol. 48, No. 2, pp. 77-94, 1953.

3/ Bastin, E. S., The Nickel-Cobalt-Native Silver Ore Type: Econ. Geol., vol. 34, pp. 1-40, 1939.

4/ Everhart, D. L. and Wright, R. J., op. cit., p. 88.

in the Whip, Main, and New Shafts (see fig. 4). The vein is also exposed at a very few places along the surface and in shallow pits.

Where the Alhambra vein can be seen in place it consists of a vein of carbonate from about 6 to 18 inches wide in a sheared, altered, and mineralized zone in gneissoid granite. The vein structure is complex and shows the effects of repeated brecciation and mineralization, which were made possible by recurrent movement along the vein. The vein filling consists of carbonates, estimated to be about 90 percent of the vein filling, the rest is limonite and oxidation products. No sulfides or arsenides, etc. were seen nor would they be expected so close to surface; however, they are visible in vein material on the dump. Quartz and jasper are present but probably do not exceed 2 or 3 percent of the vein zone.

Parallel to the vein and extending from it into the host rock for several feet is a zone of reddish, hematic, iron-stained rock which forms an alteration halo along the vein zone.

The vein was mapped (see fig. 4) by Gillerman who found that it probably extends about 550 feet north of the old mine workings, thus the vein has a total indicated strike length of about 1100 feet. The north half of the vein is partly concealed beneath alluvium. North of the alluvial cover is a quartz monzonite porphyry dike with rhyolitic margins which trends southwesterly across the vein zone but the relationship between the vein and dike are not clear. Gillerman interprets the dike as being pre-ore and believes that it is crossed by the vein.

Field relations and old maps of the mine workings reveal that the vein has been divided into 3 segments, a north, middle, and south segments, by two westerly trending cross faults. The south cross fault, which strikes southwesterly and dips steeply south, has displaced the

vein horizontally about 30 feet and the north cross fault has displaced the vein about 60 feet. Both of these cross faults are thought to be post ore because fragments of brecciated ore are reported to have been found along the faults.

There is no record that any mining or intensive exploration has been done north of the north cross fault. Available maps indicate that drifts were driven along the north fault to the faulted extension of the vein on the second and third levels, but there is nothing to indicate that the segment of the vein north of the fault was explored.

The vein has been mined extensively to relatively shallow depths between the north cross fault and the Carr tunnel, but the full extent of these workings is unknown. The Main Shaft explored the south segment of the vein to a depth of 125 feet, but the available records do not show that any drifting or mining was done in this segment of the vein below the second level or about 60 feet below the surface.

The occurrence of ore in the Alhambra mine has been described in several old reports by mining engineers familiar with the mine during the years when it was actively exploited for silver. These descriptions indicate that the main vein is from 14 to 24 inches in width and occupies a fault or shear zone that ranges from about 2 to 7 feet in width and averages about 4 feet wide. Several shoots of extraordinarily rich silver ore occurred along this vein-fault zone. Individual ore shoots had a strike length of a few feet to about 60 feet long and an unknown length along the pitch, which is probably steeply to the north. The width of the individual shoots of silver ore was from 2 to 8 inches, but was about 2 feet in a couple of shoots. These high grade shoots of silver ore

occurred sharply segregated from the enclosing gangue material; however, some silver was disseminated in the gouge in sufficient quantity to form low grade ore. In May, 1890 high grade sil er ore, exposed in the floor of the 110 level was reported to extend about 40 feet south of the North fault, and similar ore was found on the south end of the same level. The first of these ore shoots was reported to be 40 feet long, and 8 inches wide, and the other ore shoot was reported to be 15 feet long and y inches wide.

Although the Alhambra mine had been a successful producer for several years and had been productive to a depth of 110 feet in the New shaft, the mine was sold in August, 1890 to new owners who resumed active development. According to newspaper accounts the New shaft was deepened from about 110 feet to a depth of 300 or 350 feet and drifts on the vein were started or driven on the 160, 180, 222, and 300 levels. This work was terminated in June, 1893 when the shaft was reported to be 350 feet deep, and the mine was closed in July because of the low market price of silver. It is doubtful if the shaft reached the reported depth of 505 feet. The mine was sold at sheriff's sale in March, 1894.

It is reported that good silver ore was exposed in all of the deeper workings. The mine was operated successfully by lessees from about 1894 to 1899.

During all of the active years of the property no significance was attached to the occurrence cobalt-nickel ores, although these had long been recognized at the Black Hawk and Rose mines, and are present in visible quantities on the Alhambra dump. Attention was first directed to the nickel-cobalt ores by A. A. Leach.[5] These ores apparently are present in unknown amounts and none have been produced commercially except as a by-product of silver mining. Information available in old records

5/ Leach, A.A., Eng. and Min. Jour. Vol. 102, No. 11, p456, Sept., 1916.

indicates that the veins may be slightly zoned, with silver ores occurring relatively near the present surface and the cobalt-nickel ores occurring at greater depth. Little could be learned of the distribution of pitchblende, but it is thought that it is probably associated with the deeper ores, as is the case in many veins containing pitchblende.

Pitchblende has been found on some of the Alhambra dumps by Gillerman, and the presence of radioactivity is indicated by a Geiger counter. By using a Victoreen Instrument Company Beta-Gamma survey meter Model 263 equipped with a bronze electrode, background counts averaging about 12 divisions and ranging from 10 to 15 divisions on the first (0.2) scale were obtained. In some of the pits and shafts counts as high as 18 to 20 were obtained on the first scale. Counts as high as 18 to 20 were obtained on the dump of the New shaft, where selected material yielded counts of 5 to 8 divisions on the 2.0 scale.

A specimen collected from the dump of the New shaft by Gillerman was assayed as follows:

Ni 0.35% Co 0.27% U_3O_8 0.15%

Other samples collected by Gillerman and analyzed by semi-quantitative spectroscopic analysis indicated that nickel, cobalt, and silver were each present in amounts ranging from 0.01 to 0.1 percent.

Two samples were taken by the examiners and semi-quantitative spectrographic analysis obtained of the uranium and regular assays made on the silver. Results are as follows:

Description	Radiometric U_3O_8	Ag
24 inches of vein material in Main Shaft	- .01%	0.4
Selected material from dump of New Shaft	.01%	3.45

Cobalt and nickel values are being determined at the present time.

The value of these samples is merely that the presence of uranium is verified by the assays. Uranium values are low as may be expected. The sampled material represented the rejects of hand-cobbed ore mined for silver. Whether or not the silver ore contained larger or smaller amounts of uranium cannot be determined.

PROPOSED EXPLORATION

The applicant proposes to explore for cobalt-nickel-uranium ore by rehabilitating some of the old workings and by drifting and/or by sinking the shaft.

The applicant's proposed exploration program consists of 6 stages as follows:

PHASE I:

1) Access way	$ 1,500.00	
2) Uncovering vein on surface	100.00	
3) Small building	350.00	
4) Reclaiming shaft and unwatering in order that sinking and drifting can be commenced	10,215.00	
		$12,165.00

PHASE II:

375 feet of drifting to explore the northern section of the vein, at $10.00 per foot	11,250.00

PHASE III:

100 feet of sinking to explore beneath the formerly productive section of the vein, @ $120.00 per foot	12,000.00

PHASE IV:

200 feet of drifting to further explore the new depth obtained in the center section of the property, at $30.00 per foot	6,000.00

PHASE V:

100 feet of raising in order to gain greater benefit from PHASES II and IV, @ $30.00 per foot	3,000.00

PHASE VI:

Assaying 25 samples for nickel-cobalt-uranium and 25 samples for nickel-cobalt	525.00
TOTAL COST OF EXPLORATION PROJECT	$44,940.00

It is possible that PHASE III may be abandoned after the old workings are cleared out and rehabilitated. If inspection of the old workings indicate that further sinking of the shaft is inadvisable, then the shaft sinking will not be done. If the shaft is not deepened, then the drifting proposed under PHASE IV should be provided to explore the main ore zone near the bottom of the shaft, and it is expected that this drifting will be done north and south of the shaft. Considerable latitude should allowed in the location and extent of the proposed drifts and raises so that unforeseen contingencies can be met as they arise. All work should meet with the approval of DMEA examiners, and should be modified, if necessary, as the work progresses and as additional data become available.

The applicant proposes to rehabilitate some of the old workings at his own expense after the shaft is dewatered.

The applicants prefer to do the work on a short form contract.

EVALUATION OF THE PROPOSED EXPLORATION

The similarity of the veins of the Black Hawk district to productive silver-cobalt-nickel-uranium veins in other parts of the world is the basis upon which Gillerman recommended exploration of the Black Hawk mine with DMEA assistance. For this same reason Gillerman is of the opinion that exploration of the Alhambra mine should be encouraged. It is

thought that exploration of the Alhambra would indirectly encourage search for uranium in other parts of the district and that discoveries might be made which might result in the production of important amounts of uranium.

R. F. Robinson is in agreement with Gillerman, and is of the opinion that exploration of the Alhambra mine is justified because of the presence of pitchblende in the vein, which the writer of this report, J. M. Faick, does not share. I believe the vein, and the ore shoots within it are too small to justify further exploration, although it is possible that some ore may remain in the old workings. It is possible that individual ore shoots might reach considerable depths. If nickel-cobalt uranium ore is found, it is hardly possible that it would be present in significant amounts, because of the apparent small size of the ore shoots. If all of the ore previously mined, possibly 500,000 ounces of silver, had been nickel-cobalt-uranium ore it would not have constituted an important source of this type of ore.

CONCLUSIONS

An accurate evaluation of the Alhambra mine is impossible because of the inaccessibility of the old workings and the lack of data pertaining to the occurrence of the nickel-cobalt-uranium ore. Appraisal of the mine and the proposed exploration venture must be based upon the following factors:

<u>Favorable Factors</u>

1. Gillerman's study of the district for the Trace Elements Division of the U. S. Geological Survey and for the Atomic Energy Commission reveal that the Alhambra vein is one of the best potential sources of nickel-cobalt-uranium ore in the Black Hawk district.

2. The veins of this district are quite similar in mineralogy and occurrence to veins that have produced most of the pitchblende mined in other parts of the world.

3. Pitchblende in nickel-cobalt-silver specimens has been found on the Alhambra dumps and ore of this type is reported to have been produced from the mine, probably as a by-product of silver mining.

4. The scant cobalt-nickel-uranium ore on the dump might indicate that this type of ore was left in the mine because it may not have been rich enough in silver to mine profitably.

5. There is no reason to believe the mine was exhausted; it was shut down because of economic reasons.

6. If shoots of cobalt-nickel ore remain, it is most likely that they are present near the north end of the old workings where exploration is proposed.

7. The proposed exploration is feasible, and can be accomplished at a reasonable cost.

8. Success in this venture would stimulate activity in other parts of the district, and it is reasonable to think that production of uranium would result.

<u>Unfavorable Factors</u>

1. The small showings of nickel-cobalt-uranium ore may indicate that only small, minor amounts of it are present.

2. Ore shoots of this type are small, but rich, and normally yield only small tonnages per foot of depth, however they may persist to considerable depths.

3. A great deal of exploration and development work must be done per ton of recoverable ore from this type of deposit.

4. Old records and reports are too unreliable to be trusted, therefore evaluation of the mine and planning of an exploration program is difficult and uncertain.

5. The veins are relatively narrow, therefore production of large quantities of ore are not to be expected.

RECOMMENDATIONS

The decision to approve or deny this application is unusually difficult because the decision depends partly upon administrative policies and partly upon the general philosophy of exploring for certain critical commodities. Nickel-cobalt-uranium ores are in short supply as shown by the 90-10 participations ratios, and efforts to increase the supply of these commodities are justified. This project would primarily evaluate the uranium potential of the Alhambra mine, and would secondarily determine the nickel-cobalt content of the ore. Indirectly the project would encourage prospecting and exploration of other veins in the district, and significant amounts of nickel-cobalt uranium ores conceivably could be discovered.

The favorable and unfavorable factors to be taken into consideration in evaluating the Alhambra mine are listed in the conclusions. The favorable factors outweigh the unfavorable factors, therefore it is recommended that this application for exploration aid be granted.

DMRA-2954, TRINITY EXPLORATION COMPANY'S ALHAMBRA MINE
BULLARDS PEAK MINING DISTRICT, GRANT COUNTY, NEW MEXICO
(Nickel-Cobalt-Uranium)

Engineering Report

By John H. Soule'
Mining Engineer
U. S. Bureau of Mines

June 1953

DMEA-2934, TRINITY EXPLORATION COMPANY'S ALHAMBRA MINE
BULLARDS PEAK MINING DISTRICT, GRANT COUNTY, NEW MEXICO
(NICKEL-COBALT-URANIUM)

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INTRODUCTION

The Bullards Peak, or old Blackhawk Mining District of Grant County, N. Mex. is an old silver district where some rich silver ores were mined. Most of the mines of the area ceased production in 1893 because of the decline of silver prices and probably because of the depletion of the bonanza ores. Cobalt, nickel and uranium minerals have been reported in specimens said to have been obtained from the district. Because of the reported presence of the above minerals, the area has been of interest to various members of the U. S. Bureau of Mines and the U. S. Geological Survey.

R. J. Helmquist and M. J. Sheridan of the Bureau of Mines examined the properties in the district on March 3 to 8, 1945. W. R. Storms of the Bureau of Mines examined the Alhambra and Black Hawk mines on June 24, 1948, the Black Hawk again on July 19, 1949, and the Alhambra again on July 26, 1949. J. H. Soule[7] of the Bureau of Mines accompanied Storms on the 1949 visits, then visited the Alhambra mine again late in 1951. The U. S. Geological Survey became interested in the area and detailed mapping was undertaken during the last year or so.

The Black Hawk Consolidated Mining Co., owner of the nearby Black Hawk mine, applied for and received DMEA assistance to explore its mine. The work was done in 1952. Recently E. A. Schreer and B. C. Dyer, a partnership operating as the Trinity Exploration Co.,

acquired the Alhambra mine and applied to the Defense Minerals Exploration Administration for Government assistance to explore the property. The application, Docket DMEA-2954, was sent to the field for an examination of the property and a study of the applicant's estimated costs.

ACKNOWLEDGMENTS

Acknowledgment is made of the material obtained from Bureau of Mines reports by W. R. Sterns, R. J. Helmquist, and M. J. Sheridan, as well as material obtained from the Bureau of Mines files. Acknowledgment also is made of the material obtained from the application, Docket DMEA-2954.

LOCATION, TOPOGRAPHY AND PHYSICAL FEATURES

The Bullards Peak district is situated about 21 miles by road west-southwest of Silver City, N. Mex., and some 2 miles northeast of Bullards Peak. The Alhambra claim lies astraddle of the lower part of the common section line between secs. 20 and 21, T. 18 S., R. 16 W., as shown in figures 1 and 2.

The mine is most easily reached by travelling westward from Silver City on paved U. S. Highway 260 for about 14 miles, or 0.5 miles west of the Tyrone road-U. S. 260 Junction, thence southward across the Mangas Valley to the mouth of Black Hawk Canyon, thence southward up this canyon, past Saddle Rock Canyon, for about 7.5 miles to the impassable rock creek bottom. From that point, proceed on foot southerly for about a half mile, thence westward for another

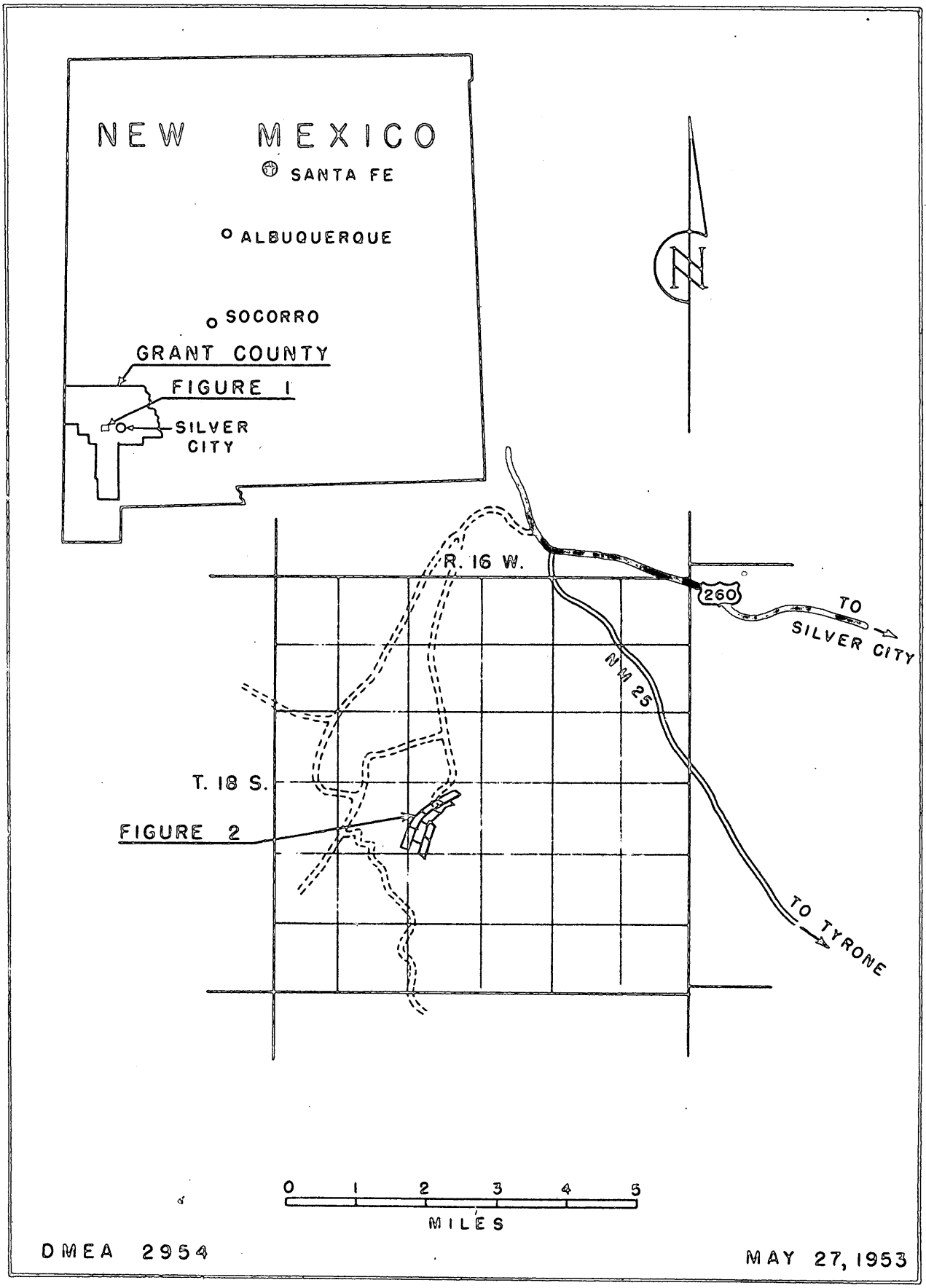

FIGURE 1.- LOCATION MAP, ALHAMBRA MINE, GRANT COUNTY, N. MEX.

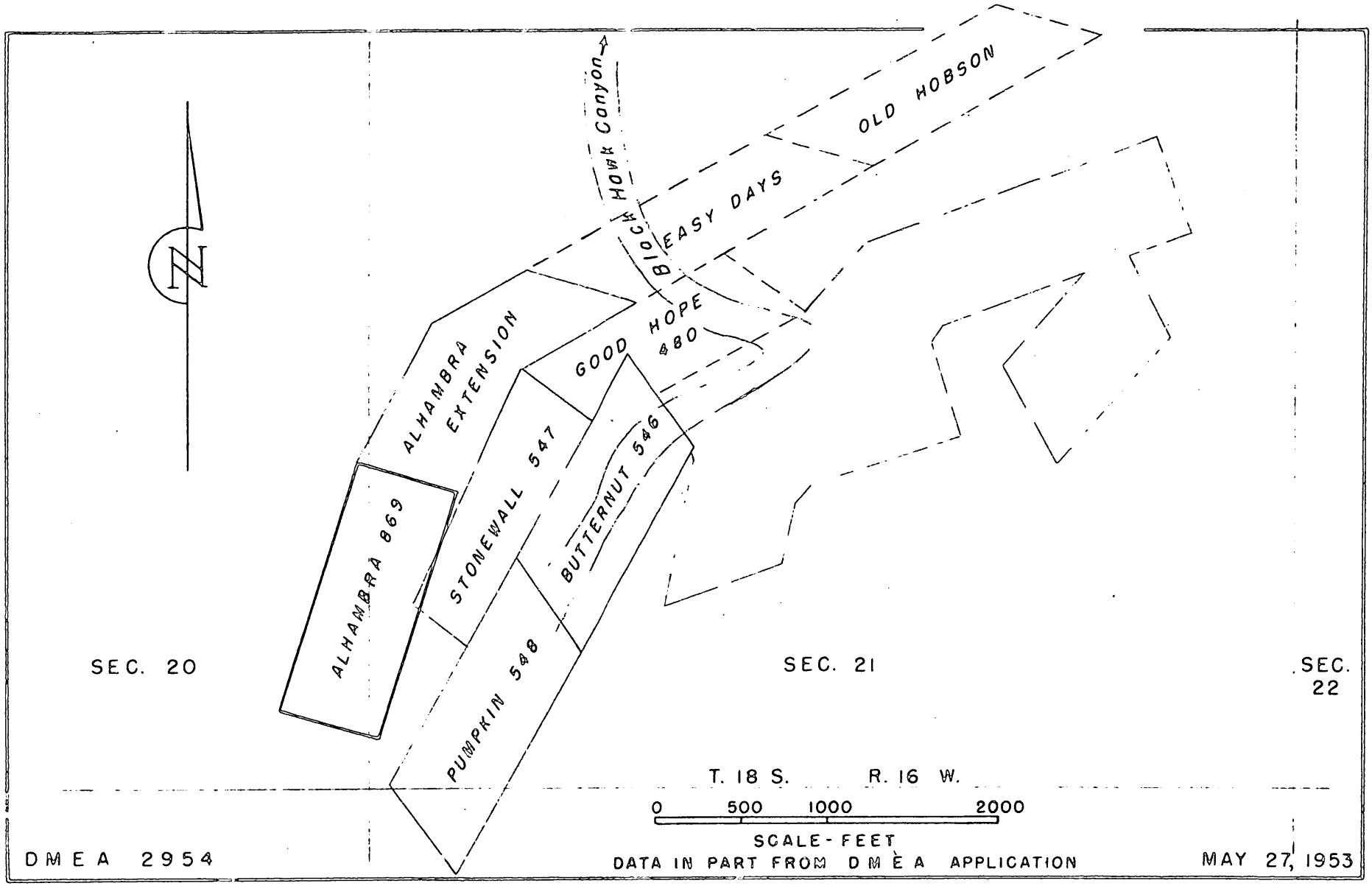

FIGURE 2. - CLAIM MAP - ALHAMBRA MINE

half mile to the mine. An alternate route that might be more easily rehabilitated would be to enter Black Hawk Canyon as before, thence southwesterly up Saddle Rock Canyon for nearly 4 miles to the first large creek (Goat Canyon) west of Saddle Rock Canyon, thence south up this creek for about a mile, thence easterly half a mile back into Saddle Rock Canyon, thence southerly up Saddle Rock Canyon half a mile, and then southeasterly out of the canyon towards a low ridge. The road becomes impassable just before reaching the ridge and travel from this point must be done on foot. The mine lies about half a mile northeast of this point. The routes are shown in figure 1.

The Bullards Peak district lies in the northwestern foothills of the Burro Mountains at an altitude of approximately 6,000 feet above sea level, some 2 miles northeast of Bullards Peak. This peak is the highest point in the area. The region is covered with scattered junipers and small pines, with scrub oaks and other brush on the lower slopes. Large cottonwood and black walnut trees grow in spots in Black Hawk Canyon. No permanent streams are found nearer than the Gila River, some 7.5 miles airline to the northwest. Annual precipitation amounts to about 17 inches with heavy rains in July, August, and September, and a small amount of snow during the winter.

No buildings or equipment are situated at the mine. The nearest available water is in a well at the mouth of Saddle Rock Canyon, some 5 miles from the mine, or from another well in the Mangas Valley near the mouth of Black Hawk Canyon.

There is a well about a mile south of the Alhambra mine and in Black Hawk Canyon but this water is not easily accessible by road. Water probably could be obtained by digging a shallow well in the canyon near the mine. Water stands about 40 feet below the collar of the Alhambra shaft but this water is reported to be full of arsenic.

Most supplies and equipment could be obtained in Silver City, although some of the larger pieces and repair parts might have to be obtained at El Paso, Texas, some 157 miles by road or railroad southeast of Silver City.

HISTORY AND PRODUCTION

The initial boom in the Bullards Peak (sometimes called the Black Hawk in earlier publications) mining district was started in 1881 when high-grade silver float was discovered on the surface at the present site of the Alhambra mine. Subsequent prospecting soon lead to the discovery of the Black Hawk and other properties.

The district is reported to have produced from $1,000,000 to $1,500,000 from the time it was discovered until 1893, when most of the work ceased due to the decline of the price of silver and the depletion of most of the bonanza ore. Nearly all of the production has been high-grade silver ore which probably was sold to mills and smelters then operating in the Silver City area. Shipments of ore assaying as high as 1,500 ounces of silver are reported from the district.

Since the shutdown in 1893, none of the mines have been operated although a little work was done several years ago on the Black Hawk mine near the Alhambra. Nothing has been done on the Alhambra since 1893.

There are no reliable production figures for the mines although the Alhambra is generally rated the second largest producer with an estimated production of about $300,000. As far as can be determined, all of the production was made from silver ores and no production of cobalt, nickel or uranium ever was made.

OWNERSHIP AND EXTENT

The Alhambra group of claims consists of 5 patented and 3 unpatented lode claims which are shown in figure 2. The Trinity Exploration Co. has leased, with option to purchase, the group. All of the proposed work is to be done on the Alhambra claim. The group is owned by Albert A. Leach and his wife of Lordsburg, N. Mex.

DESCRIPTION OF THE DEPOSIT

The country rock of the Alhambra mine is a gneiss generally regarded as of pre-Cambrian age. This rock has been intruded by monzonite in the form of small dikes near the mine. A large intrusion of the monzonite occurs north of the property.

The Alhambra vein strikes a little east of north and dips nearly vertical. The vein is reported to vary from a few inches to 3 feet in width. Old maps of the stoped sections show that the mined portions of the vein were small and had little lateral or vertical extent. Assuming an average width of 2 feet for the mined part of the vein, a total of 640 tons of ore was mined above the second level.

The ore mineral was native silver and often of very high grade. Nickel and cobalt minerals were reported with the silver. Uranium was reported in the ore bodies. The gangue minerals were carbonates and barite. Very little nickel, cobalt, or uranium minerals were noted in the dump material and the vein, where noted, is highly leached. There is no evidence of oxidized nickel or cobalt minerals in the vein and it is assumed that such, when present accompanied the silver ores. The small amount of radioactivity suggests the same for any uranium minerals, none of which were noted in the surface exposures of the vein.

MINABLE ORE RESERVES

There are no data upon which to compute any ore reserves. Therefore, it must be considered that there are no minable ore reserves of any category in the Alhambra mine.

PRESENT STATUS

The Alhambra mine is idle at the present time. There has been no work done on the property since 1893, or for 60 years. The condition of the mine workings below water level is unknown, while those above water level are in a poor state of repair.

The mine was developed by 3 shallow shafts and one main shaft, reportedly between 400 and 505 feet deep. Figure 3, which was taken from an old map, shows the mine workings down to the third level. Nothing is known of the workings below this level although they must certainly exist as the stope areas above the third level would account for only a small tonnage of ore unless such was of very high grade.

ECONOMIC FEATURES

Referring to figure 3, and considering only the most productive part of the mine above the second level, the maximum amount of stoping was about 25 percent of the developed area in longitudinal section, or about 4,000 square feet of the 16,000 square feet in the section. Assuming an average vein width of 2 feet and a tonnage factor of 12.5, this would indicate that 640 tons of ore was mined from this area. The mine has a seemingly reasonable reported total production of $300,000 during a period when silver averaged a little more than $1.00 per ounce. If all of the ore was derived from the section above the second level, a value of $468.75 per ton is indicated. It is difficult to reconcile a mine producing that grade of ore having to close because of the decline of the price of silver in 1893. Still more difficult to reconcile is that no attempts were made to reopen the mine during later periods of more favorable economic conditions. It is more logical to assume that the bonanza ores were exhausted or that the grade of the ore was much lower and that additional stoped areas exist below the second level and are not shown on the map. This serves to increase the area of the longitudinal section from which production was made.

The applicant plans to explore an area of nearly 16,000 square feet on the longitudinal section of the vein. There is no reason for assuming a greater percentage of stoping in the area than is shown above the second level. Hence, about 4,000 square feet of stoping ground may be developed by the exploration, or the equivalent

of 640 tons of ore. This is exclusive of a possible small amount of ore that may be available in stopes below the second level. Assuming a maximum value for the ore of $500, allowing for the new lower silver price, and adding possible payments for the probable small amount of nickel, cobalt and uranium in the ore, this would mean a total of $320,000 to be realized from the sale of the ore, neglecting metallurgical losses. The Government's royalty on this ore to repay for DMEA participation would be $16,000, far short of the Government's $40,445.00 estimated share of the project. It is far more reasonable to assume that the original ore was derived from a larger area of the section and this would decrease the value of each ton of ore. As the applicant's area remains constant, this only means still less royalty to be paid the Government. Even if a discovery were made, such a discovery could not be considered significant.

An additional feature would be the metallurgical characteristics of the ore. It seems evident that only a small tonnage of ore could be indicated by the proposed exploration. Even allowing for great latitude and increasing any possible reserves by ten times, the reserves would be insufficient to sustain the operation of a small mill for any length of time. A mill or far shipment to such a mill is mandatory to separate the nickel, cobalt and uranium minerals from the silver minerals. The temptation would be to ship any high grade silver ore to nearby smelters and the critical minerals

would be lost. Should a contract be entered into with the applicants, there should be some provision whereby the Nation would receive the critical metals that are the basis for the exploration, should any be found.

PROJECT PROPOSALS WITH COSTS

The Trinity Exploration Co. in its application for Government assistance proposed a project to cost $44,940.00. The work was to consist of surface rehabilitation, road construction, and underground work, including the rehabilitation of the shaft. The proposed work was divided into 7 phases which will be discussed separately. All of the following cost figures were intended by the applicant for a short form contract.

The first phase is divided into 4 parts. The first is the construction and rehabilitation of a road to permit access to the property. The cost is estimated to be $1,500.00. This is considered a little excessive as approximately 600 feet of road recently was constructed to a nearby property with similar terrain at a cost of less than $100.00. This would indicate an access road cost of $500.00 and possibly a little more if the applicant's chosen route contains more difficult terrain. It probably is to the Government's advantage that this item be executed on the long form type of contract with a maximum allowable of $1,500.00.

The second part of phase 1 was to consist of bulldozing or uncovering part of the vein north of the north fault. No specific amount of work was proposed and the cost was estimated to be $100.00. This item seems better entered as a long form item with a maximum allowable of $100.00.

The third part of Phase 1 is the construction of a small building for tools, supplies and equipment. The estimated cost for this building is $350.00. This seems a little too reasonable for a 20-by 20-foot building even of the cheapest construction.

The fourth and last part of Phase 1 is the reclamation of the main shaft to permit entry into possible lower levels. This is a most difficult item to evaluate because so many data are lacking about conditions existing in the shaft below water level and the caved collar. This shaft has not been worked for 60 years. The applicant estimates a cost of $10,215.00 to reclaim a reported 505 feet of shaft. This includes the erection of a headframe as well as the depreciation on equipment. A minimum estimation of costs follows which is based upon the ~~shaft~~ supposition that the shaft below water level is in usable shape. This felt to be improbable.

TABLE 1. - Shaft Reclamation.

Preparatory work, cleaning shaft collar and area	$200.00
Retimber collar and 60 feet of shaft @ $30.00 per foot	1,800.00
Simple headframe and dump, labor and supplies	450.00
Backfill around new collar	500.00
Muck out debris on door in shaft reported at 63 feet	100.00
Depreciation on pump for 12 months	220.00
Depreciation on power generator for pump for 12 months	600.00
Power cable	650.00
Installation and reinstallation of pump as water lowers	750.00
Depreciation on 2-inch water column	72.00
Depreciation on gasoline hoist for 12 months	600.00
Hoist freight and installation	250.00
Fuel and lubricants for hoist and power generator	250.00
Depreciation on shaft bucket and mine car	60.00
Supervision for 2 months	1,000.00
Various small tools and hardware	200.00
Total	$7,702.00

The total from the above table is $2,513.00 less than the $10,215.00 estimated by the applicants. However, no consideration was given in the above table for rehabilitation work in the shaft below the door reported at 63 feet. If the shaft were quickly flooded and the timbers were in good condition when flooded, it is possible that they are now in a perfect state of preservation and that little extra work would be required other than minor repairs and cleaning. However, a caved section or two with other necessary repairs could easily make the total cost exceed the applicant's estimates. It is felt that the applicant's estimate of $10,215.00 is reasonable for reclaiming 505 feet of shaft, but should be termed as $20.00 per foot as there may not be 505 feet of shaft. It may be necessary to insist upon certain standards of work as there could be a tendency to cut corners and not fully correct possible hazardous conditions. All timbers should be sound and the manway restored to perfect condition. All state safety regulations must rigidly be adhered to.

Phase II consists of 375 feet of drifting on the vein north of the shaft. Approximately 60 feet of this work is crosscutting along a fault to reach the faulted portion of the vein. This work is to be done in a drift reportedly started at depth in the shaft but its actual location is not known. It is shown at the 400-foot level in figure 3. The applicant estimates a cost of $30.00 per foot for this work. These costs are reasonable.

Phase III is sinking the shaft an additional 100 feet. The advisability of sinking the shaft is questioned as it is possible that there remains much ground above the shaft bottom that can be more cheaply explored by drifting. Shaft sinking should be resorted to only if the area above the shaft bottom is completely explored. The applicant estimates a cost of $120.00 per foot of shaft and these costs are deemed very reasonable.

Phase IV was to consist of drifting from the shaft addition, 100 feet each on two new levels, 50 feet apart. Perhaps this drifting could be done above the present shaft bottom to good advantage, dispensing with the shaft sinking. The applicant estimates a cost of $30.00 per feet for this work. These costs are reasonable.

The proposed work in Phase V consisted of 100 feet of raising. This work is deemed unnecessary for the following reasons: First, if ore is found on the drift, raising them becomes development work and an improper item in an exploratory project. Second, if no ore is found in the drifting, four short raises, totalling 100 feet,

would be inadequate to warrant driving in the hope of making a significant discovery. In other words, the ore bodies are of such small size that should each raise encounter one, a significant discovery with respect to nickel, cobalt and uranium is not probable. The applicant's estimated costs of $30.00 a foot for raising are felt to be a little high considering the short raises to be driven. Twenty Dollars is felt to be a more reasonable price figure.

Phase VI consists of assaying 25 samples for cobalt and nickel, and 25 samples for both metals, and in addition, uranium. The applicant estimates $525.00 for all of the assays. This is below the commercial rates established by one commercial assayer in Arizona who charges $5.00 for each of the analyses, or a total of $625.00 for the lot.

Cost details were not worked out for phases II, III, and IV. Because of the isolation of the property and the added cost of delivering materials to the ground, as well as some possible preparatory work in cleaning possible existing drifts not allowed for in the application, in addition to furnishing ventilation to the working places, the costs are likely to be somewhat low and therefore are acceptable.

One of the applicants, B. C. Dyer, is known to the writer, having visited the Bureau of Mines Silver City office several times while the writer was there. He was engaged in some small prospecting projects

in the area. Nothing is known of the quality of the work he performed and nothing is known of his ability to supervise the project he proposed.

CONCLUSIONS

The following conclusions were derived from a study of data pertaining to the Alhambra mine and from 2 visits to the mine:

(1) Cobalt, nickel and uranium minerals are said to occur in the veins at the Alhambra mine. These veins were worked for their rich silver content. The meager data on these minerals in the literature seems to indicate, with the possible exception of uranium, that the minerals were mere occurrences and that no large bodies were found. Uranium is excepted because it is entirely possible that occurrences present during the time the mine was operated may have been overlooked.

(2) The total production from the mine, reportedly $300,000, is small and the negligible amounts of cobalt, nickel and uranium minerals on the dumps suggest that any such minerals accompanied the silver ores. That ore bodies of the different minerals were not separate is further suggested in the oxidized zone where no visible trace of cobalt and nickel minerals are present. It is true that the zone is highly leached but some suggestive remaining mineralization should be present.

(3) The applicants plan to explore an area roughly equivalent to an area of the mine where less than 1,000 tons of ore was mined.

There is no reason to expect better conditions with the new exploration than that shown by former mining. This amount of ore, even if high in cobalt, nickel and uranium, would not constitute a significant discovery.

(4) Based on reasonable expectations of ore value and the quantity that could be indicated by the proposed exploration, the royalties paid to the Government would fall far short of the Government's participation in the project.

(5) As all of the ore minerals seem to occur in close relationship, a treatment plant must be erected or the ores shipped long distances to treatment plants so that the Government would benefit from any cobalt, nickel and uranium in the ores. The temptation would be to ship rich silver ores, if encountered, to a nearby smelter, thus depriving the Nation of cobalt, nickel, and uranium, the basis of the proposed project.

(6) The applicant proposes a project consisting of shaft rehabilitation and underground work costing $44,490.00. Because of the small size of possible ore bodies, this type of work would be more satisfactory than drilling. The applicant suggests that all work be done by short form contract. There are too many unknowns in Phase I of the proposed work and this item perhaps should be on the long form, while the remaining phases can well be done by short form type of contract. The applicant's cost estimates seem to be reasonable.

(7) Although the writer is acquainted with one of the applicants, E. C. Dyer, nothing is known of his ability to supervise a project such as he proposes.

(8) It is likely that all supplies, equipment and labor necessary for the proposed project are available.

(9) The Alhambra mine is relatively isolated and not accessible to motor vehicle at the present time. About one half a mile of road must be constructed or rehabilitated to permit entry into the property.

RECOMMENDATIONS

Based upon conclusions 1 to 5, inclusive, it is recommended that the application for Government assistance, Docket DRA-2954, be denied.

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

2954

224 New Customhouse
Denver 2, Colorado

March 23, 1953

MAR 24 1953

Memorandum

To: Secretary to the Operating Committee, Defense Minerals Exploration Administration

From: Field Team, Region IV

Subject: (Nickel, Cobalt, Uranium) - Application of Trinity Exploration Company, Alhambra Mine, Grant County, New Mexico

Enclosed are three copies of the subject application for exploration aid in the amount of $32,500.00.

One copy of the application is being retained in this office.

W. H. King
W. H. King

Ogden Tevetts
for A. H. Koschmann

Enclosure

TRINITY EXPLORATION COMPANY
P. O. BOX 992
SILVER CITY, NEW MEXICO

March 17, 1953

The Defense Minerals Exploration Administration
Bureau of Mines
224 New Customhouse Building
Denver 2, Colorado

Gentlemen:

The Trinity Exploration Company respectfully submits the enclosed application for aid in an exploration project to evaluate an occurrence of nickel, cobalt and uranium minerals, and to permit an engineering study of its development.

Sincerely,

Bill C. Dyer

Bill C. Dyer
Partner

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 27 1953

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

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 - 2954
Metal or Mineral
Date Received 3-27-54
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: Trinity Exploration Company (Partnership, Clark County, Nev.) P. O. Box 992, Silver City, New Mexico
Partners are: Bill C. Dyer, Box 992, Silver City, New Mexico (Legal Name) and Ernest A. Schroer, Jr., Box 823, Henderson, Nevada

(*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: Mineral Survey No. 869 - Alhambra Lode Patent No. 24500 (6/18/94) Las Cruces Land District, State of New Mexico, T18S R16W, Bullard's Peak Mining District. Net Area 20.25 Acres.

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

(*c*) State your interest in the land, whether owner, lessee, purchaser under contract, or otherwise Lessee with option to purchase

(*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. See attached pages 1 - 8

(*e*) If you own the land, describe any liens or encumbrances on it Not applicable. See (d) above.

(*f*) If the land consists of unpatented claims, add to the description above, the book and page numbers for each recorded location notice. Not applicable

4. *Physical description.*—(*a*) Describe in detail any mining or exploration operations which have been or now are being conducted upon the land, including existing mine workings and production facilities. State your interest, if any, in such operations. Also describe accessibility of mine workings for examination purposes. See attached pages 9 - 12

(*b*) State past and current production, and ore reserves, if any, giving quantities and grades. Attached pp. 13-14

(*c*) Describe the geologic features of the property, including mineralization, type of deposit (vein, bedded, etc.), and your reasons for wishing to explore. Illustrate with maps or sketches. Send with your application (but not necessarily as a part of it) any geologic or engineering report, assay maps, or other technologic information you may have, indicating on each whether you require its return to you. See attached pages 15 - 18 and page 27

(*d*) State the facts with respect to the accessibility of the project: Access roads, distances to shipping, supply and residence points. See attached page 18

(*e*) State the availability of manpower, materials, supplies, equipment, water, and power.
See attached page 18

16—66551-1

5. *The exploration project.*—State the mineral or minerals for which you wish to explore Nickel, Cobalt and Uranium Minerals

(*b*) Describe fully the proposed work, including a map or sketch of the property showing a plan (and cross sections if needed) of any present mine workings, and the location of the proposed exploration work as related to such features as contacts, veins, ore-bearing beds, etc. See pages 19 and 27

(*c*) The work will start within 15 days and be completed within 9 months from the date of an exploration project contract.

(*d*) State the operating experience and background of the applicant with relation to the ability to carry out such exploration project, and also that of the person or persons who will supervise the operations. See attached page 20

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

(*a*) *Independent contracts.*—(Note.—If the applicant does not intend to let any of the work to contractors, write "none" after this item. To the extent that the work is to be contracted, do not repeat the cost of the contract-work in subsequent items.) State the cost of any proposed independent contracts for the performance of all or any part of the work, expressed in terms of units of work (such as per foot of drilling, per foot of drifting, per hour of bulldozer operations, per cubic yard of material moved, etc.). See attached page 21

(*b*) *Labor, supervision, consultants.*—Include an itemized schedule of numbers, classes and rates of wages, salaries or fees for necessary labor, supervision and engineering and geological consultants. See attached page 21

(*c*) *Operating materials and supplies.*—Furnish an itemized list, including items of equipment costing less than $50 each, and power, water and fuel. See attached pages 22 and 23

(*d*) *Operating equipment.*—Furnish an itemized list of any operating equipment to be rented, purchased, or which is owned and will be furnished by the Operator, with the estimated rental, purchase price, or suggested use-allowance based on present value, as the case may be. See attached page 24

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

(*f*) *New buildings, improvements, installations.*—Furnish a detailed list showing the cost of any necessary buildings, fixed improvements, or installations to be purchased, installed or constructed for the benefit of the exploration project. See p. 25

(*g*) *Miscellaneous.*—Furnish a detailed list showing the cost of repairs to and maintenance of operating equipment (not including initial rehabilitation or repairs of the Operator's equipment), analytical work, accounting, workmen's compensation and employers' liability insurance, and payroll taxes. See attached page 25

(*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. See attached page 25

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 [ ] Use of equipment owned by you [ ] Other

Explain in detail on acompanying paper. See attached page 26

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 March 17, 1953

Trinity Exploration Company
(Applicant)

By Bill C. Dyer
(Partner)

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

3. Applicant's property rights.-

(d) The next attached seven pages are a copy of A Lease and Option to Purchase with Supplemental Agreement signed and executed between the owners of the Alhambra Mine, Mineral Survey No. 869, Patent No. 24500, as parties of the first part and Bill C. Dyer and Ernest A. Schroer, Jr., a partnership doing business as Trinity Exploration Company, as parties of the second part.

To the best of our knowledge and belief, the attached is a true, accurate and complete copy.

Attached Page 2
Trini[illegible] Exploration Co.
Box 9[illegible], Silver City, N. M.

THIS LEASE AND OPTION TO PURCHASE, made and entered into this day of February, 1953, by and between ALBERT A. LEACH and FRANCIS I. LEACH, husband and wife, of Grant County, New Mexico, parties of the first part, and BILL C. DYER, of Grant County, New Mexico, and ERNEST A. SCHROER, JR., of Clark County, Nevada, parties of the second part.

WITNESSETH, That the parties of the first part, in consideration of $1,000.00 to them in hand paid by the parties of the second part, the receipt whereof is hereby acknowledged, and of the mutual promises hereinafter contained, do hereby give and grant unto the parties of the second part the exclusive right and option to purchase those certain patented lode mining claims situate in the Bullard's Peak Mining District, in School District 5, Grant County, New Mexico, described as follows, to-wit:

Claim	Mineral Survey No.
Alhambra	869
Butternut	546
Stonewall	547
Pumpkin	548
Good Hope	480

And also those certain three unpatented lode mining claims, named and described, and the notice of the location of each being of record in the office of the County Clerk of Grant County, New Mexico, and Mining Location Records, as follows:

Claim	Book	Page
Alhambra Extension	38	256
Easy Days	38	257
Old Hobson	38	256-7

together with all and singular the mines, minerals, lodes and veins within the lines of said claims and their dips, spurs, and angles, and all dumps, water and water rights, improvements, rights, privileges and appurtenances thereunto in anywise belonging.

1. The purchase price to be paid for said premises is Fifty Thousand Dollars ($50,000.00), which shall be payable in installments in the following amounts and at or before noon on the dates following, to-wit:

Upon execution hereof	$1,000.00
August 1, 1953	500.00
February 1, 1954	2,500.00
May 1, 1954	1,000.00
August 1, 1954	1,500.00
November 1, 1954	1,500.00

February 1, 1955	7,000.00
August 1, 1955	7,500.00
February 1, 1956	7,500.00
August 1, 1956	10,000.00
February 1, 1957	10,000.00

provided that the payments on the purchase price shall not exceed in any year, the payments specified in the above schedule for that year. All payments shall be made by depositing the same in the American National Bank of Silver City, New Mexico, to the order and credit of Francis I. Leach.

2. It is mutually understood and agreed that time is of the essence of this agreement, and that failure to pay any of the installments of the purchase price as above set forth, shall terminate this agreement at once, and all rights thereunder. This clause shall serve as instructions to The American National Bank of Silver City, New Mexico, in the event of failure to pay any installment of the purchase price as specified above, to promptly surrender to the parties of the first part, all papers held in escrow.

3. Simultaneously with the execution hereof, the parties of the first part agree to make, execute, acknowledge and place in escrow with The American National Bank of Silver City, New Mexico, their warranty deed conveying said patented claims, and their quit claim deed conveying said unpatented claims, to the parties of the second part, their heirs and assigns, and the parties hereto shall likewise execute to said Bank escrow instructions controlling the holding and delivery of said deeds in conformity with the terms and conditions hereof and deliver said deeds to the parties of the second part when parties of the second part shall make full payment of the purchase price for said premises as herein provided.

4. The parties of the first part covenant to and with the parties of the second part that they have good and merchantable title to said premises, free and clear of former grants, liens, encumbrances and taxes.

5. From the date hereof and during the life of this agreement the parties of the second part shall have the exclusive right to the possession of all of said premises and to work and mine the same and to extract, remove, concentrate, ship and sell all ores found therein and thereon, but upon such ores, minerals, or metals, or compounds or salts derived therefrom, extracted, removed and sold from said premises the parties of the second part shall pay unto the parties of the first part royalties as follows:

On ores and products derived therefrom a royalty of 10% of the net value, with deduction of smelter treatment charges and railroad transportation only.

Payments of said royalties shall be made not later than the 20th of each calendar month for returns received during the preceeding calendar month, accompanied in each case by duplicate mill, smelter or other buyers settlement sheets.

In addition to the aforesaid royalties party of the second part shall pay to the parties of the first part, to the extent that it is legal so to do, ten per cent (10%) of all subsidy, bonus or premium payments made to the parties of the second part by the United States Government or any agency or instrumentality thereof, resulting from his operation under this agreement.

All of said payments shall be made to the parties of the first part at said bank, and shall apply upon the purchase price of said premises, and shall go to reduce the amount of the next falling due installment or installments thereof.

6. All work done hereunder shall be performed in a good and minerlike fashion with a view to the preservation of the premises as a workable mine, timbering wherever the same shall be or become necessary, and maintaining all drifts, shafts, levels and other workings well drained, free from loose rock, waste and rubbish and in condition for continued mining, unless prevented from so doing by strikes, labor troubles, accidents, breakdowns or other causes beyond the reasonable control of the parties of the second part.

7. The parties of the second part shall pay all taxes and assessments levied against said premises, the improvements thereon, the product thereof and the operation conducted thereon, for the year 1953 and all subsequent years during which this agreement is in effect.

8. The party of the second part shall comply with the provisions of the Workmen's Compensation Act of New Mexico, the New Mexico Unemployment Compensation Act, the New Mexico Occupational Disease Disablement Act, the Federal Social Security Act and all other legislation, federal and state, applicable to the working and operation of said premises and shall make all payments, returns and reports required by such acts and shall at all times protect and save harmless said premises and the owners of and from any and all claims, actions, suits, liabilities for damage or compensation for any matter or thing arising out of the work and operation conducted in or upon said premises.

9. The parties of the second part shall promptly pay for all labor, services and materials done, performed or furnished to or for said premises or for the work done therein and shall not allow any claim of lien for any such thing to be effectually made or asserted against said premises or the owners thereof and shall keep said premises posted with notices against liens in accordance with the statutes of the State of New Mexico in that behalf.

10. The parties of the first part or their agent authorized in writing, shall have the right at all reasonable times to enter into and upon said premises and the workings therein for the purpose of examining and inspecting the same, and ascertaining whether the terms and conditions hereof are being carried out and performed by the parties of the second part; and the parties of the first part or their agent authorized in writing, shall at all reasonable times have access to records of production from said premises and such other records as will show compliance on the part of the parties of the second part with the provisions of this agreement.

In the event of the termination of this agreement and option and escrow for any other cause than by fulfillment of the terms hereof the parties of the second part will upon request of the owners deliver to the owners copies of all maps of mine workings, assay maps and drill logs made by or for them pertaining to said premises.

11. If the parties of the second part shall at any time be in default in the performance of any of the terms and conditions hereof upon them made incumbent, excepting the payment of royalty or purchase price, such default shall not operate to or give the parties of the first part the right to cancel, forfeit or terminate this agreement, unless the parties of the first part shall notify the parties of the second part in writing specifying the exact nature of such default and unless the parties of the second part shall, within thirty (30) days from the date of the receipt of such notification, fail to proceed diligently to cure such default.

12. Upon the termination of this agreement for any cause other than by fulfillment of the terms hereof, the right of the parties of the second part to purchase said premises and the right to the possession of the same and the right to work and mine said premises and remove, ship and sell ores therefrom shall at once cease and determine and the parties of the second part agree in any such event to at once, without demand or notice, deliver up unto the parties of the first part the possession of said premises, and in any such case any and all sums of money theretofore paid hereunder, either as installments of purchase price or as royalty, shall be and become the property of the parties of the first part.

13. It is expressly understood between the parties hereto, anything herein contained to the contrary notwithstanding, that this agreement is an option given by the parties of the first part to the parties of the second part and no penalty shall accrue or be asserted against the parties of the second part for failure to perform any of the conditions, terms and agreements hereof, and that the parties of the second part may surrender and terminate this agreement at any time, and thereupon any liabilities of the parties of the second part hereunder shall immediately cease and terminate, except liability on account of any obligation arising out of their mining operations on said premises incurred and owing at the time of such termination.

14. In the case of the termination of this agreement for any cause, the parties of the second part shall have the right, within sixty (60) days from the date of such termination, to remove from the premises all or any of the property placed upon said premises by him, including, without limit, all fixtures, equipment, buildings, structures, pipelines, stockpiles and other severable items regardless of how, when or where placed, affixed, attached or imbedded, but excluding and excepting mine support shafts, collars, head frames, ladders, timbers and ties, rails and pipe in place below the surface.

15. It is mutually understood and agreed that the parties of the second part shall perform the annual assessment work required by law to be done on the unpatented claims, the Alhambra Extension, the Easy Days and the Old Hobson, each assessment year during the life of this agreement; and the annual work shall be completed and proof of labor filed by the first day of June of each year and the work shall be started not later than April 1, 1953.

16. All notices required to be sent under any provision of this agreement shall be sent to the parties of the first part in care of Francis I. Leach, Bin U, Lordsburg, New Mexico, and to the parties of the second part, to Bill C. Dyer, P. O. Box 992, Silver City, New Mexico, with copies thereof to The American National Bank of Silver City, New Mexico, escrow agent.

17. The parties of the second part may not assign their rights in this agreement without the prior written consent of the parties of the first part.

18. Each and every clause, condition, covenant and agreement hereof shall be binding upon and inure to the benefit of the respective heirs, executors, administrators, legal representatives, successors and assigns of the parties hereto.

IN WITNESS WHEREOF, The parties hereto have set their hands, all in triplicate originals, as of the day and year first above written, one of which shall be lodged with said escrow bank for its information in receiving payments hereunder.

(Signed) Albert A. Leach
Albert A. Leach

(Signed) Francis A. Leach
Francis A. Leach

(Signed) Bill C. Dyer
Bill C. Dyer

(Signed) Ernest A. Sehroer, Jr.
Ernest A. Sehroer, Jr.

STATE OF NEW MEXICO)
) ss.
COUNTY OF GRANT)

On this 27th day of February, A. D. 1953, before me personally appeared Albert A. Leach, Francis I. Leach and Bill C. Dyer, to me known to be the persons described in and who executed the foregoing instrument and acknowledged that they executed the same as their free act and deed.

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

(Signed) Della Burk
Notary Public

SEAL

My Commission Expires Feb. 10, 1957

STATE OF NEVADA

COUNTY OF CLARK

On this 23 day of February, A. D. 1953, before me personally appeared Ernest A. Schroer, Jr., to me known to be the person described in and who executed the foregoing instrument and acknowledged that he executed the same as his free act and deed.

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

(Signed) Clark W. Coleman
Notary Public

SEAL

My Commission Expires: June 4, 1955

Attached Page 8
Trinity Exploration Co.
Box 992, Silver City, N. M.

SUPPLEMENTAL AGREEMENT

AS A SUPPLEMENTAL AGREEMENT to that certain written lease and option to purchase, dated February 26, 1953, between the undersigned, as the parties of the first part, and BILL C. DYER and ERNEST A. SCHROER, JR., as parties of the second part, we do hereby agree with the parties of the second part as follows:

The parties of the second part may and shall have the right to obtain a loan from the Defense Mineral Exploration Administration (D.M.E.A.) of the Federal Government for use in carrying on the development work under the said lease and option to purchase on the Alhambra Patented Mining Claim, Mineral Survey No. 869, and enter into the required contract with the said agency in obtaining and using the money from the said loan, or from any successor agency of the Federal Government hereafter authorized to make similar loans, and that we shall and will sign and execute any required contract or other instrument in writing required of us as owners in futherance of the securing of said loan, it being agreed and understood, however, that we are not to be bound any further or subject to any liabilities by reason of the said loan, and any instruments which we shall sign, than the liabilities imposed by such agency for a percentage of the production of the said mine in repayment of said loan, in the event and after the parties of the second part shall cease development work and production under the said lease and option to purchase.

IN WITNESS WHEREOF, we have hereunto set our hands at Silver City, Grant County, New Mexico, this 26th day of February, 1953.

(Signed) Albert A. Leach

(Signed) Francis I. Leach

STATE OF NEW MEXICO)
) ss.
COUNTY OF GRANT)

On this 27th day of February, A. D. 1953, before me personally appeared Albert A. Leach and Francis I. Leach, husband and wife, to me known to be the persons described in and who executed the foregoing instrument and acknowledged that they executed the same as their free act and deed.

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

(Signed) Della Burk
Notary Public

Original received Feb. 27, 1953.
American National Bank, Silver City, N. M.
(Signed) J. A. Wilson, Vice-Pres.

SEAL

My Commission Expires Feb. 10, 1957

4. Physical description.-

(a) The next attached:

Brief Description and History of the Alhambra Mine

by Joe E. Sheridan, E. M.
(Mine Inspector for the State of N. Mex.)
Written Prior to 1924

describes in best available detail the mining and exploration operations which have been conducted on the property. The described development was carried out prior to 1894. No further work is known to have been done.

Operations by the Trinity Exploration Company have been confined to an inspection of the property. The present main shaft is accessible by rope only to a depth of about 47 feet, which is the present water level. Short drifts, one of about 12 feet and one of about 80 feet, from the first level of this shaft have been inspected.

The old main incline shaft (referred to as such on the attached map) is accessible by rope to a depth of about 20 feet, with no water. Drifts are open a short distance at this level.

Another shaft, not shown on the original map but indicated on the attached copy, is accessible by rope to a depth of about 20 feet, with no water. The north drift at this level is open for about 25 feet. The south drift is the old Carr Tunnel, as indicated on the map, as is open some 35 feet.

The shaft shown on the map as the Whip Shaft is not safely accessible.

While no ore is found by the inspection of the above, it is worthwhile to note that the stopes were found to correspond in location, and in approximate size and shape with those shown on the map.

Mr. Sheridan's report indicates a depth of 505 feet in main shaft (indicated on the original map as the proposed new shaft). L. C. Graton, U. S. G. S. Prof. Paper #68, indicates a depth of 400 feet. A. A. Leach in one paper indicates a depth of 400 feet and in a later paper indicates a depth of 520 feet. All engineering reports on the mine, as well as old newspaper accounts of the development of the mine, indicate and show this development to depth to have been done at the point shown on the map as the Proposed New Shaft. Field measurements show this to be true.

No reliable indication of the drifting at depth is available.

4. Physical description.-

(a) Continued

BRIEF DESCRIPTION AND HISTORY OF THE ALHAMBRA MINE

by Joe E. Sheridan, E. M.
(Mine Inspector for the State of N. Mex.)
Written Prior to 1924

The Alhambra mine is located in Bullard's Peak Mining District, Grant County, New Mexico. The property is held under patent from the United States Government.

The nearest railroad at present in operation is the E. P. & S. W. R. R. at Tyrone, N. M., which is seven or 8 miles distant, constructed by the Phelps Dodge Copper mining interests of the Burro Mountains. There is a good wagon road to within a short distance of the mine.

The country rock has been classified as gneiss, also as gneiss-oid syenite, which is dissected by dikes of monzonite porphyry and diorite which probably bear close relation to the genesis of the ore deposits. In the gangue accompanying the ore, frequent inclusions of barite and calcite are found, generally known to the miners as "spar"; and where this rock is found in the vein very rich ore is usually found nearby or intermixed with it.

The ores extracted were principally aggentite and native silver, the native silver being distributed through the quartzose gangue, but frequently occuring in small masses from one ounce to several pounds in weight. Again it is found associated with and disseminated through inclusions of nicollite, and also as wire silver in vugs. The writer has a few specimens of the above described ores in his collection, which he took from the mine upon visits to it in the time of its activity between 1889 and 1892. Some fine specimens of argentite were also secured at that time, the argentite being found associated with all the various kinds of gangue, calcite, barite and quartzose rocks; as also intermixed with spalerite, and chalcopyrite, the latter ore being found in small inclusions in some places in the mine.

The general average of the ore produced and sold assayed from 400 to 3000 ounces of silver per ton, several of the shipments running as high as two thousand ounces of silver per ton. Some second grade ore was shipped which gave returns of $200.00 to $400.00 per ton.

The mine is developed by four shafts at intervals of 100 to 200 feet apart. The main shaft is said to be 505 feet in depth, as shown by a crude map by H. Fitzsimmons who was in charge of the property when last operated. I was informed by miners employed on the work that the lowest 35 feet of the shaft was in very rich ore, some specimens of which they gave me. The ore bodies as proved in the upper level at and near the surface was about 300 feet in length as demonstrated by the length of the old stopes; the very rich ore ranged in width from 2 inches to 12 inches. The mine has produced more than $300,000 in value of these rich ores. Much rich ore was diverted from its proper owner and unaccounted for; hence production was greater than the records show.

4. Physical description.-
(a) Continued

No attention was paid to the ores of lesser grade which with present day appliances would produce as much revenue as the rich ores.

The vein is from two to four feet in width and outcrops for a distance of about 600 feet. It is of deep seated origin and will persist to a great depth.

As a result of observation on my several trips through the mine I formed the opinion that the operators were very negligent in the matter of development, no method to their operation. They would find a chute of rich ore, take it out and quit the locality to return perhaps months later, thus they were constantly out of touch with their work. In mines of this character it is well known that some very slight indicator may be encountered which if followed may lead, and often does lead, from one ore body to another. To get the benefit of such indicator it must be followed while fresh in mind.

Only the manager, his son and one or two men were employed the greater part of the time it was operated under the last management. At times operation was suspended that the crew might enjoy a spree.

In the earlier days of the operation of the mine it produced exceedingly good results. I was frequently in the mine and was familiar with the workings. In later times it was under control of a lady who depended largely on the virtues of divining rods resembling two chopsticks, which she had purchased from a Mexican peon; to direct the explorations for ore.

There are many characteristics of this property and of the mines of the district that bear close resemblance to Cobalt District, Ontario.

At present price of silver it is a very inviting mining proposition and in all probability would develop into a dividend paying mine. No attention was paid to low grade ore which now may be a valuable product of the mine.

When I last visited the property, September, 1910, after it had been idle many years, I took note of the following:

At the main shaft there was a shaft house in a good state of preservation; the dimensions of the shaft house are about 40 x 50 feet. A 40-horsepower boiler; a double cylinder 40-horsepower hoisting engine and steel cable, in fairly good condition, are in the shaft house, together with a large iron bucket and a few tools. There are several large pieces of saw timber, one foot to 18 inches in diameter and 10 to 12 feet long, all in good state of preservation lying near the shaft house. The old machinery would probably be found valueless, too expensive to operate and it would be a decided economy to install up to date machinery.

4. Physical description.-

(a) Continued

The collar of the shaft has caved to a depth of about 15 feet, but the timbers appeared intact below that depth as far as could be seen. There was also a good gallows frame over the shaft.

The other three shafts range from 80 to 120 feet in depth.

The mine produces sufficient water for hoisting purposes, and an ample supply of good water for domestic purposes is found in the gulch close by.

As an undeveloped but very promising mining venture the Alhambra property, at a reasonable price, is recommended as a good business proposition.

Joe E. Sheridan, E. M.

4. Physical description.-

(b) The past production of the Alhambra mine is estimated at $300,000 (all prior to 1894) by Sheridan (attached page 10) and by Leach in a paper a copy of which is attached under 4 (c).

Graton, in U.S.G.S. Prof. Paper #68, describes the Alhambra secondly of the four mines he mentions in the district to which he indicates a production of perhaps $1,000,000.

The figures represent silver values only. At the time of operation the nickel, cobalt and uranium that did occur with the silver "were lost in smelting".

There is no current production.

It was generally considered by authors of past engineering reports and, now, by those familiar with the history of the operations, that no low grade ore was directly mined. It is considered that the only low grade handled was ore broken in the process of development and in mining the high grade. If true, some low grade ore should be found in place.

There are no available figures as to the quantities of ore produced except those inferred by the above estimated production figures.

As to the grades of the ore:

The nickel ores are reported as occurring as from small inclusions up to the following, which is taken from the Mineral Resources of the U. S. 1915, U.S.G.S., Part I, page 753:

> "In one place in the Alhambra vein a shoot, possibly the one just referred to in the quotation from Waring, from 2 to 3 feet wide (other dimensions not given) is said to have carried from 15 to 20 per cent of nickel, in the form of niccolite, and the ore was rich in silver."

The cobalt ores are probably best considered as associated mineralization with the nickel minerals. There are some indications that the nickel-cobalt ratio will be from 2/1 to 10/1.

Finely disseminated pitchblende probably accounts fot the amounts, up to 2%(no doubt, select sample), of some radio-active minerals in the nickel-cobalt ores of the camp, according to A. A. Leach.

4. Physical description,-

(b) Continued

None of the above is to be construed as the applicants' approximation as to the quantities or grades of mineralization. The value placed upon the above statements and figures is simply one that historically establishes the occurrence of nickel, cobalt and uranium minerals in the Alhambra mine and in the other mines of the camp.

The work of the U. S. Bureau of Mines and of the U. S. G. S. (recently completed investigation) firmly establishes the occurrence of nickel and cobalt in the Alhambra mine, in as much as specimens from the dumps have been so identified, and the dumps sampled and assayed. It is also understood that the U. S. G. S. has recently reported on the radio-activity on and about the Alhambra mine.

For further confirmation of the known occurrences and of the possibility of a commercial production, reference is made to the fact of recent D. M. E. A. participation in a core drilling program for cobalt and uranium on the Black Hawk mine, which lies some 1500 feet (corner to corner) from the Alhambra mine.

For convenience, a list of all known publications referring to the mineralization of the Alhambra mine and the camp in general is presented below. These works (1) discuss the silver, nickel, cobalt, and uranium minerals and their occurrences, (2) show a resemblance to other occurrences of silver-nickel-cobalt-uranium ores, and (3) discuss the geology of the mine and camp generally. The applicants can furnish copies of any,

1) U. S. G. S. Prof. Paper #68, 1910, pp. 324-325.
2) New Mexico Mines and Minerals, F. A. Jones, 1904, pp. 54-55.
3) Mineral Resources of the U. S. 1915, Part I, p. 753.
4) The Metal Resources of New Mexico and Their Economic Features, New Mexico School of Mines, 1933, p. 25, p. 33, p. 47.
5) The American Mineralogist, vol. 20, no. 10, Oct. 1935, p. 720.
6) Proceedings of the Colorado Scientific Society, vol. 1, pp. 46-47, of section Mineralogical Notes by Hillebrand.
7) The School of Mines Quarterly, Vol. XIV, 1892, p. 49.
8) Also a paper in the Engineering and Mining Journal, Sept. 9, 1916, by A. A. Leach, which is copied and attached under part 4 (c) of this application.

4. Physical description.-

(c) Some of the statements and references under 4 (b) above also apply here as far as geologic features and mineralization are concerned.

Probably the best general account of the geologic features of the property is that of A. A. Leach. This paper was published, some 27 years before Mr. Leach acquired ownership of the Alhambra mine, in the Engineering and Mining Journal, Sept. 9, 1916, Vol. 102, No. 11, page 456.

Black Hawk Silver-Cobalt Ores
by Albert A. Leach*

Among the old silver camps of New Mexico that are being reopened since the rise in the price of silver is one that is likely to prove of interest to mining men because of its unique type of deposit. It is the old camp of Black Hawk, lying 12 miles northwest of Tyrone in Grant County, which is interesting because of its deposits of nickel and cobalt arsenides in commercial quantities together with massive native silver and argentite. The ores are identical with those of Cobalt, Ont., and so far as I have been able to ascertain, are the only important deposits of this type in the United States.

The camp is an old one, having been discovered and worked in the early eighties, and intermittently up to 1893, when the mines were closed and allowed to fill with water. Since that time no work of importance has been done in the camp until recently, when the high price of silver again awakened interest in those long-abandoned camps.

During the short period of operations, the camp produced rather heavily considering that only the high-grade ores were handled. The cyanide process was not then in general use and no effort was made to treat the low grade ores, which were thrown onto the dumps with the waste rock. The production of the camp is variously estimated. The United States Geological Survey gives the production of the camp as $1,000,000. The mine owners say this figure is too low and that the camp produced upward of $1,500,000. Much difficulty was experienced with high-graders and it is claimed that their operations were so successful at some of the mines as to rob the owners of all profits. Much of the ore was massive native silver which, it is stated, averaged the high-graders from $800 to $1,000 a sack.

The Black Hawk mine is the deepest in the camp, having attained a depth of 750 feet on the vein. Its production is estimated at $650,000. The mine was closed in 1888 because of litigation and remained idle up to February, 1916, when the litigation was settled for a cash consideration and the property bonded to Minneapolis capitalists. Work was commenced at once on the mine, and the shaft is now being dewatered and retimbered preparatory to further exploration. The property is under the management of E. D. Lidstone, who is thoroughly familiar with the Black Hawk deposits, having made a careful examination of the mine prior to the shut down. It is claimed that valuable ores were exposed

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* Chief geologist, Burro Mountain Copper Co., Tyrone, N. M.

4. Physical description

(c) Continued

in several places in the mine when it was closed and it will probably be producing steadily in short time. A cyanide plant will be installed to treat the old mine dump and the low-grade ore.

Sufficient information is lacking regarding the mineral associations at this mine to enable a statement asv to whether the nickel and cobalt ores were of any particular importance. The native silver here was very massive and was mined literally in sheets weighing up to 200 pounds. Specimens of the ore resemble globs of melted coin, and one piece that went through the rolls (the nearest approach to a mill the old timers had) was flattened into a huge shaving-like slab of almost pure silver.

The Alhambra mine was an important producer of cobalt and nickel ores as was also the old Rose mine. The Alhambra was worked to a depth of 400 feet and made a production of $300,000. Its ores were chiefly native silver and niccolite carrying from 300 to 2000 oz. silver per ton. Considerable smaltite was noted, also some millerite, all carrying silver. It is reliably stated that the niccolite ore streak was from 2½ to 3 ft. in width. The whole vein matter carries from 10 to 50 oz. silver per ton, but the native silver ore usually occurs in a chute, whose pay streak is from 8 to 24 in. wide and assays 400 to 6,000 oz. silver per ton. Argentite occurs as filling in fractures and as crystals on the niccolite and spar gangue. Some hand specimens show niccolite, smaltite, millerite and crystals of argentite with crusty masses of erythrite and annabergite.

At the old Rose mine, which was exploited to a depth of 200 feet, a large percentage of the ore was smaltite and chloanthite with high silver content. The upper stopes are said to have produced chiefly cerargyrite. The total production of the mine was about $150,000. Work was suspended before any real development work was accomplished and only a small part of the workings are now accessible.

The geology of the camp is simple. The country rock is pre-Cambrian gneiss cut by monzonite porphyry dikes which radiate from the main porphyry mass on the northwest side of the camp known as Twin Peaks. The veins usually parallel the dikes or are otherwise associated with them, and are of the true fissure type, ranging in width from 2 to 5 ft. They are all of the same general type, having a spar gangue, usually calcite or barite, and invariably present an intensely brecciated appearance.

There is considerable activity in the camp at present and some of the newer prospects are showing up so well they may be expected to enter the producing class any day. Some large chunks of very rich silver float picked up on the east side of the camp recently have stimulated prospecting somewhat and the camp seems to be demonstrating its ability to come back.

4. Physical description.-

(c) Continued

Attached is a copy of a map apparently drawn during late 1890 or early 1891. The red markings are additions resulting from the recent inspection of the property.

The point on the map indicated as "Proposed New Shaft" is the location of the present main shaft reported to be 400 to 500 feet deep. At this point on the property are the remains of an old boiler and the largest dump on the claim. The collar has caved in so that the shaft at the surface is about 20 or 25 feet across. The shaft's original dimensions show up about 10 feet from the surface. Water stands at about the 47 foot level.

Verbal reports handed down from the last superintendent of the mine call for a door over the shaft at about the 60 foot level. Investigation showed the following:

1) It is 47' from the present surface to the water level.
2) Approximately 6' below the water level muck is encountered.
3) A pointed tool on the end of a pipe will pass through 10' of this muck and become firmly stuck into what feels to be timber.

These figures total 63' and agree closely to the reported location of a door over the shaft. Apparently this muck is from the caving of the collar since the drainage on the surface is such that no large amount of soil or muck would wash into the shaft.

Old newspaper accounts report the progress of the sinking of this shaft in some detail and drifts are thus known to have been driven both ways from the shaft below the drifts shown on the map. No figures as to the frequency of drifting or as to the length of drifts are available, except that the 3rd level from the shaft is at a depth of 110' with drifts to the north 137' and to the south 162'.

The other shafts on the property which have been investigated are dry. There is no where any indication that any shaft but the proposed new shaft was sunk any deeper than shown on the map, except that a shaft was sunk to connect with the Carr tunnel as indicated in red on the map. There is no reason to believe that the Main Incline Shaft as shown on the map was ever sunk deeper or connected to the workings from the "Proposed New Shaft" in any manner except as shown on the map as already existing.

Only as an approximate order of magnitude, rough assumptions indicate that unwatering the mine will require the handling of something like 1 or 1½ million gallons of water.

No information is available for estimation as to how much water the mine makes. However, it is not likely to be an unusually large amount due to the type of country rock and since the location is generally considered a dry area.

4. Physical description.-

(c) Continued

Having examined the property and having searched the literature, with good results, the applicants have reached the following conclusions:

1) That nickel, cobalt and possibly uranium occur with the silver values of the property, with some reports of commercial grades.

2) That the mine did not run out of ore.

3) That the mine shut down in 1893 when the price of silver broke and since, due to the market and to the metallurgical processes of the day, the nickel, cobalt and uranium minerals constituted no value to the operators. These latter metals ended up on the silver smelter slag dumps.

4) Reclaiming the Alhambra mine for investigational purposes and for a study of development can be accomplished for a relatively small amount of money.

5) That the potential, to us financially, and to the United States as a source of strategic nickel and cobalt and critical uranium merits the expenditure of the required time and money.

4. Physical description.-

(d) The mine is located 24 miles from Silver City, New Mexico, and is reached by traveling over 17 miles of paved highway and 7 miles of good canyon road. In order to move heavy equipment and supplies onto the property, approximately 3000 feet of road will have to be bulldozed in and bladed.

Silver City is the nearest supply and railroad shipping point. Other than the camp site, it is also the nearest residence point to be considered.

4. Physical description.-

(e) Manpower, materials, supplies, equipment and water are all readily available. Power will have to be generated at the mine.

5. The exploration project.-

(b) For the reasons given under 4 (c), this application is submitted for assistance in unwatering the Alhambra mine and in carrying out an investigation and evaluation of the property in order that merited development may be planned. The attached map shows plans and sections of the present mine workings and the location of the proposed work as related to geologic and structural features.

The proposed work covers:

1) Construction of approximately 3000' of road to permit the hauling of equipment and supplies onto the property.

2) Construction of a small building, approximately 20' x 20', to protect the hoisting and generating equipment, tools and supplies.

3) Reclaiming the present main work shaft by (a) recollaring and erecting a head frame, (b) retimbering approximately the upper 30 feet and (c) timbering as and where necessary at depth.

4) Unwatering the mine by lowering a built-together electric pump as the water level is lowered. This appears to be the only practical method since the shaft was sunk to follow the vein and will thus probably have some changes in dip.

5) Cleaning out the workings from the shaft as required to permit examination and evaluation. This may require some timbering in places.

6) Sampling and assaying. A definate plan for sampling and assaying can only be determined after the initial inspection of the unwatered workings. Ore chutes or mineralized portions of the vein will be checked for nickel, cobalt and silver since the mineralization and occurrence of the three are related. A few uranium assays will probably establish a relation to geiger counter readings. It may be that appreciable quantities of other strategic or critical minerals, now unexpected, may be found and be worthy of assaying. A very reliable assayer is located in Silver City, N. M.

5. The exploration project.-

(d) The applicants are both graduate chemical engineers.

Ernest A. Schroer, Jr., recently with the Titanium Metals Corporation, in the Industrial Engineering Department, is now self employed, probably best and most accurately described as an investor.

Bill C. Dyer, recently with the H. K. Ferguson Company as a process engineer at the Titanium Metals Corporation plant at Henderson, Nevada, will engineer and supervise the proposed operations on the Alhambra mine. He has 2 years of direct experience in engineering and supervising small mining operations, as well as several years experience as a chemical engineer. Most of his mining experience has been acquired on projects for which he was directly responsible.

Approximately 9 months ago the applicants formed a partnership doing business as the Trinity Exploration Company. The purpose being for Dyer to spend his full time in the field investigating mining properties and districts for the possible development of strategic and critical mineral deposits. To this end, Dyer resigned his position with the H. K. Ferguson Company which was at $660. per month including guaranteed overtime and Schroer has supported the company financially.

Other than prospecting, the only mining venture of the company to date has been the exploration of a hubnerite deposit. While ore was developed, the quantity was too small for successful operation.

It is also proper to state here that the applicants feel they are in position to handle the development of the Alhambra mine and to work out the chemical or metallurgical process for the separation of the various important minerals into some useful or marketable form.

As an indication of the sincerity of the applicants and of the value they place on the probability of making a significant discovery, reference is made to the copy of their contract with the owners of the property whereby, in order to secure control of the property, they have made an initial payment of $1000 cash.

6. Estimation of costs.-

(a) Independent contracts.-

It is proposed to contract the construction of the road (approximately 3000'). The best bid has been made by a reliable contractor at approximately 100 hours of bulldozing and drilling at $10 per hour with total cost in no case to exceed $1500. The $500 contingency is included under 6 (h) making the estimated cost of the road, here, ... $1000.00

(b) Labor, supervision, consultants.-

Since the exact extent of the work required in the proposed operation can not possibly be determined before hand, the following costs are based on assumptions:

1 Engineer, supervisor and working operator at $100 per week	$3680.00	
1 Assistant supervisor and working foreman at $100 per week	3680.00	
4 or less Miners at $1.50 per hour . .	4900.00	
4 or less Laborers at $1.25 per hour . .	845.00	
Estimated Cost of Labor and Supervision		$13,105.00

As the proposed operation will at times require 7 day a week operation, it is proposed to list the first two above as supervisory personnel at a flat salary.

Miners and laborers will be hired by the day or week as needed. No reason is foreseen for the employment of more than 4 miners or laborers at any one time and only for a short time will 4 be needed.

Geological consultants are available without cost.

6. Estimation of costs.- Continued

(c) Operating materials and supplies.-

Nails	$ 35.00
Nuts, bolts and washers	16.00
Bridge washers, 100#	29.00
500' 5/8" Round hanger steel	67.00
Dies, etc. for pipe & hanger steel threads	74.44
1 Gallon thread cutting oil	1.15
1 Pipe vise	17.30
1 Pipe cutter	30.00
1 Buffalo blacksmith forge	36.00
1 Anvil	20.00
200# Smithing coal	4.00
4 Drift picks and handles	12.80
4 Mucker shovels	14.08
1 Bit brace	3.56
2 Wood bits, 11/16 and 3/4	3.80
2 30" Mine saws	10.00
1 26" Carpenter's saw	4.50
1 10" G.P. File	.52
1 8" Crosscut file	.68
1 7" Slim taper file	.35
2 14" Wood rasps	5.60
2 4# Hammers and handles	5.12
1 8# Hammer and handle	3.76
1 Carpenter's hammer	3.00
2 36" Pipe wrenches	29.40
2 14" Pipe wrenches	5.66
1 30" Wood level	2.75
2 12" Crescent wrenches	5.28
2 Miner's axes	7.80
2 Wood chisels	3.90
200' 12# Mine rail	79.21
20 pr. 12# Splices	12.20
20# Track bolts	4.80
50# Track spikes	9.00
1 pc. [illegible] x 48 x 72 HR Plate	31.85
1 10' Steel tape rule	1.00
1 Steel square	2.75
200' 3/4" Rope	21.76
200' ½" Rope	2.80
10' 3/8" Chain	4.48
1 Mine safety chain	3.50
1 10" Mine Bell	8.75
600' 3/16" Bell cord	24.00
12 Safety cable clips	7.12
550' 3" Black pipe	506.00
4 3"Black 90° Ells	10.76
2 3" Black Tees	6.00
4 3" Black 45° Ells	12.00
1 3" Black Union ground joint	8.76
1 6' Wrecking bar	5.64
1 36" Claw bar	1.50
100# Black smooth wire #16	12.50
100# 40% DuPont Spec. Gel.	25.00
100 #6 Caps	2.35
500' Fuse	7.50

6. Estimation of costs.- Continued

(c) Operating materials and supplies.- Continued

2 Hydraulic oilers	$ 3.20
1 pr. 7" Diagonals	2.25
1 pr. 12" Snips	3.66
100# Miner's carbide	10.35
4 Carbide lamps 50D	16.00
4 Skullguard hats	20.00
1 First aid kit	4.50
1 doz. 6" strap hinges	3.36
1 Wheelbarrow, steel wheel	13.50
1 Foot valve 3"	5.60
3 BB Pulleys	4.40
600' Ladder	210.00
3 Geiger counter batteries	7.20
15' High pressure jet hose 3"	89.55
1 High pressure coupling	18.40
2000' TW wire #4	242.00
2 Water barrels	9.00
50 sks. cement	75.00
200# Steel reinforcing rod	26.00
650 sq. ft. galv. roofing	79.63
Greases and oils	20.00
1 ore car, used	35.00
1 ore bucket, used	35.00
1 head frame pulley (sheave and bearings)	50.00
1 Lock	2.40
Sampling cloth and tools	7.60
Sample sacks, 25	7.50
1250 Gallons diesel fuel	162.50
1800 Gallons gasoline	558.00
22,000 Board feet of timber, rough	1980.00
Electrical supplies, unitemizable - depends on exact nature of leased equipment	200.00
Misc. hardware	25.00
Estimated Cost of Operating Materials and Supplies	$5190.28

It should be noted here that some of the above items may be available in the district as used items and should be so purchased if they constitute sound savings.

Also, it should be noted here that some of the above items may vary somewhat, such as fuel costs, depending upon the exact units of equipment available for lease at the time of leasing.

6. Estimation of costs.- Continued

(d) Operating euipment.-

The following pieces of operating equipment are available at present and it is proposed that they, or similar items, be leased for the proposed work:

1) A two stage, high head, centrifugal pump capable of delivering 100 gpm at 520 feet. Powered by a built-on 50 HP electric motor. Lease price $60 per month.
For 8 months . . . . . $ 480.00

2) A 6 cylinder gasoline powered hoist (25 HP). Lease price $80. per month.
For 8 months 640.00

3) A 50 KW diesel powered generator. Lease price $400 per month.
For 8 months 3200.00

It should be noted here that, depending upon activity in the district, the above items may not be availabe at time of leasing; thus, costs can vary.

The above specific items will be delivered to and from the property without additional cost.

Trucking: The applicants propose to furnish the use of a new Willys pickup for hauling supplies and equipment, as well as men, to and from the mine. It is expected that the total miles for 8½ months of operation will be in the order of 15,000 miles. The applicants offer the use of the pickup and will assume all operating and other costs at the conventional rate for automobiles of 6 cents per mile.
15,000 miles at 6 cents per mile . . . 900.00

Estimated Cost of Operating Equipment $5220.00

6. Estimation of costs.- Continued

(f) New buildings, improvements, installations.-

It is proposed that one small building, about 20' x 20', be built for protecting the equipment, supplies, tools, etc. This is to be an economically constructed building of rough timber and galvanized roofing.

Labor costs, approx.	$200.00
Material costs, approx.	125.00
Total cost	$325.00

These costs are included in 6 (b) and 6 (c) respectively.

The applicants propose to furnish a tent and/or trailer, as well as camping equipment, for personnel without consideration.

(g) Miscellaneous.-

1)	Assays (rough estimate at this time)	$1000.00
2)	Repair costs and maintenance of operating equipment	50.00
3)	Accounting	200.00
4)	Workman's compensation and employers liability insurance	668.36
5)	Payroll taxes	589.73
6)	Expenses incurred in locating equipment for lease	30.00
7)	Mapping supplies & blue prints . .	30.00
8)	Geiger counter, furnished by applicants at no cost	
	Estimated Miscellaneous Costs	$2568.09

(h) Contingencies.-

Considering that the property has been closed down and under water since 1894, conditions, other than those that can reasonably be foreseen, may be encountered. It appears that a contingency factor of 20% should insure the success of the proposed project.

20% Contingency	$5416.63
TOTAL ESTIMATED COST OF PROJECT WITH 20% CONTINGENCY	$32500.00

7. (b)

Assuming that the cost of the proposed project does reach the maximum figure of $32,500.00 the applicants share of the cost would be $3,250.00.

One of the applicants, Dyer, will be the first listed employee (engineer and working supervisor) on attached page 21.

It is proposed that the books of the project be set up independently of the books of the Trinity Exploration Company. In such case, costs of the project paid to Dyer as salary and to the Trinity Exploration Company for the use of the pickup would be actually paid from project funds. In which case, the applicants would furnish money for their share of the cost of the project.

TRINITY EXPLORATION COMPANY
P. O. BOX 992
SILVER CITY, NEW MEXICO

Attached Page 27
Trinit[illegible] [illegible]oration Co.
Box 992, Silver City, N. M.

MAP OF THE ALHAMBRA MINE

Plans and Sections of Workings, and Geology of the Property

Return Not Requested

NAME OR TITLE OF PERSO		ADDRESS, AND ROOM	
	STOP		RUN STOP
	RUN STOP		RUN STOP
	RUN STOP		RUN STOP
	RUN STOP		RUN STOP
	RUN STOP		RUN STOP
	RUN STOP		RUN STOP
	RUN STOP		RUN STOP
	RUN STOP		RUN STOP
	RUN STOP		RUN STOP
	RUN STOP		RUN STOP
	RUN STOP		RUN STOP

Use other side first

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1. Use blocks consecutively, one at a time.
2. Void previous block.
3. Write clearly.

NAME OR TITLE OF PERSON, DEPARTMENT, ADDRESS, AND ROOM		NAME OR TITLE OF PERSON, DEPARTMENT, ADDRESS, AND ROOM	
[illegible]	RUN / STOP	~~Mr. [illegible]~~ Room ~~7518~~	RUN / STOP
~~[illegible]~~	RUN / STOP	~~Mr. [illegible]~~ ~~5323 [illegible]~~	RUN / STOP
~~[illegible]~~ ~~[illegible]~~	RUN / STOP	Helium Solid Fuels 5012	RUN / STOP
~~Mr. Flatequal~~ ~~5547~~	RUN / STOP	~~C. O. Miller~~ ~~Comptroller, D.M.E.A.~~ ~~Room~~ 4624	RUN / STOP
~~[illegible]~~	RUN / STOP	~~[illegible]~~ ~~[illegible]~~	RUN / STOP
~~[illegible]~~	RUN / STOP	~~Mr. Mittendorf~~ ~~Rm. 4624~~	RUN / STOP
~~[illegible]~~ FAS ~~[illegible] 5938~~	RUN / STOP	~~Mr. Thayer~~	RUN / STOP
~~[illegible]~~ HEADS ~~[illegible]~~ Bldg. ~~[illegible] 2nd St., NW~~ ~~Wash., DC~~	RUN / STOP	~~Butler~~ ~~Texas~~	RUN / STOP
~~Alma Ashton~~ ~~Rm. 1306 No. HEW~~	RUN ~~14~~ / STOP ~~361~~	~~EGC~~ ~~[illegible]~~	RUN / STOP
~~MR. GORDON EVERSOLE, BUREAU OF RECLAMATION, (INTERIOR)~~	RUN ~~76~~ / STOP ~~43~~	D. M. E. A. - 2954	RUN / STOP

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10—88949-2

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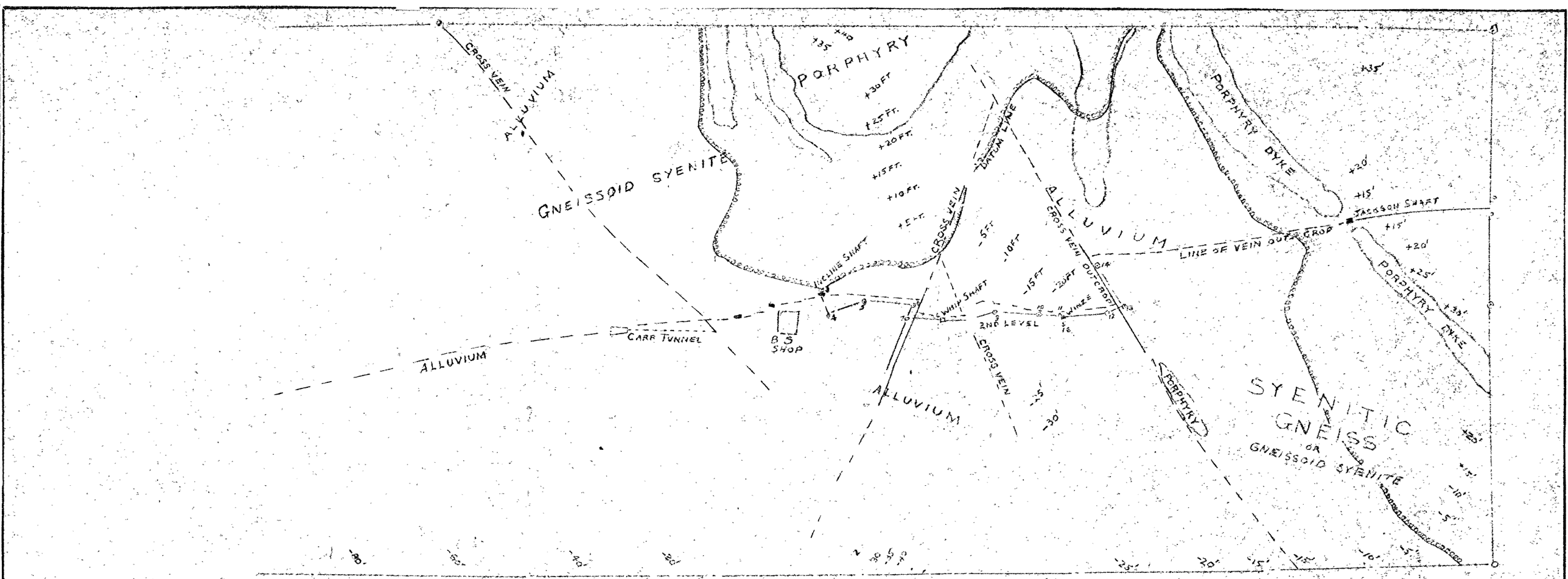
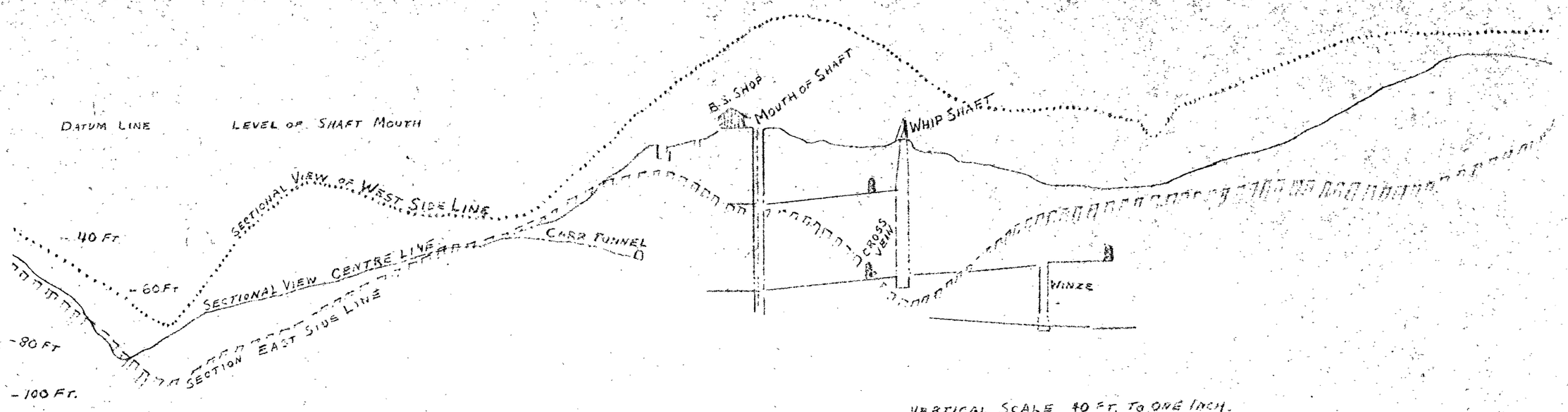
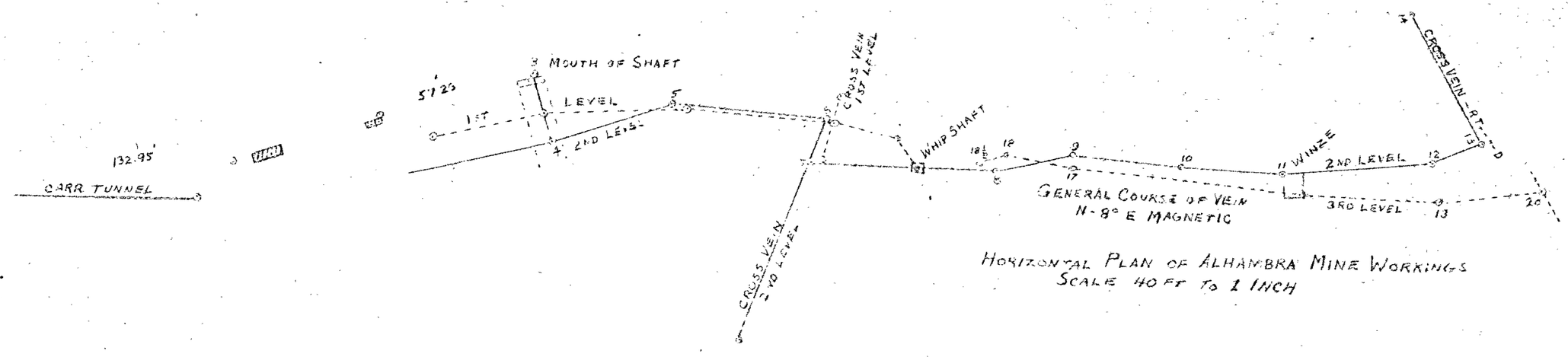


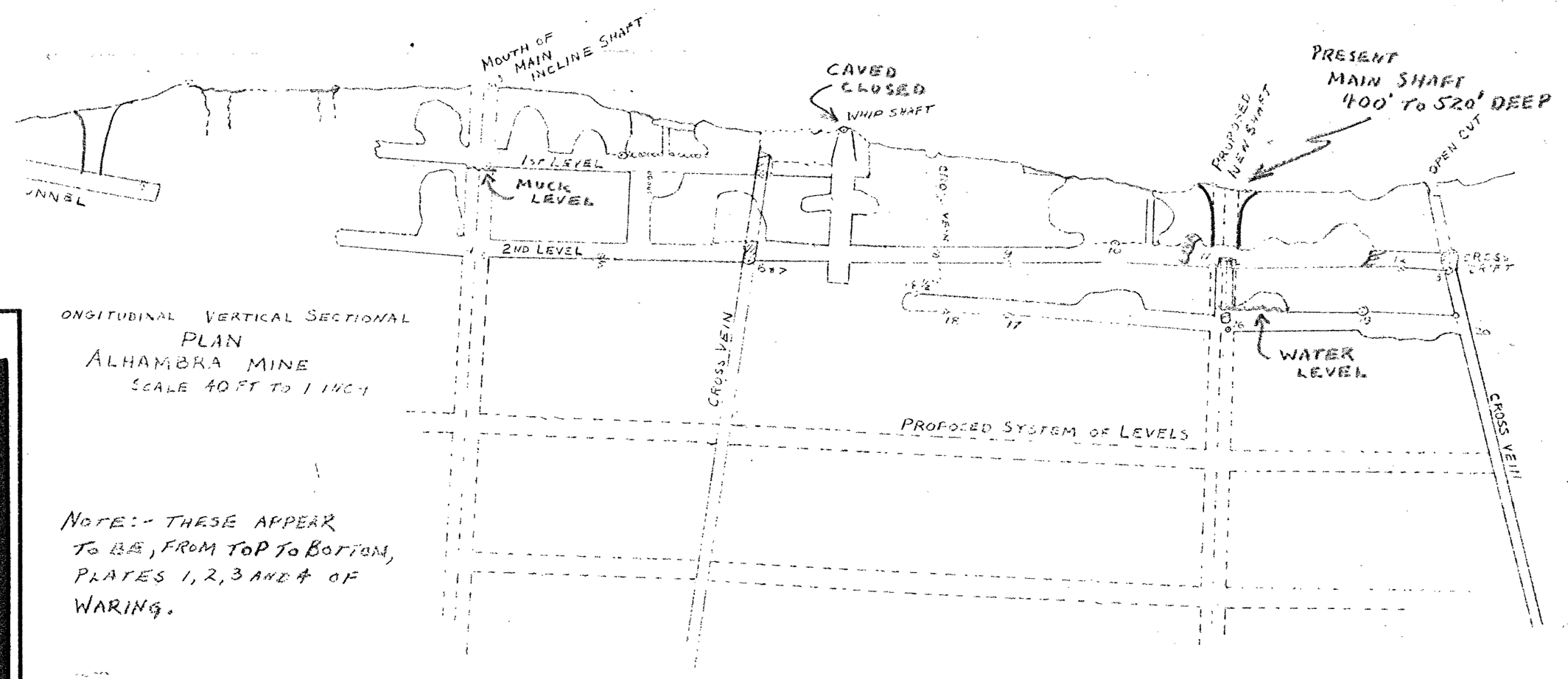
GEOLOGICAL-TOPOGRAPHIC MAP, ALHAMBRA MINE SCALE 100 FT. TO 1 INCH
CONTOUR LINES 5 FT. APART VERTICALLY. DATUM LINE (DOTTED LINE) = LEVEL OF MOUTH INCLINE SHAFT



ALHAMBRA MINE - LONGITUDINAL SECTIONS VERTICAL SCALE 40 FT. TO ONE INCH. HORIZONTAL " 100 " " " ".



HORIZONTAL PLAN OF ALHAMBRA MINE WORKINGS
SCALE 40 FT TO 1 INCH



ONGITUDINAL VERTICAL SECTIONAL
PLAN
ALHAMBRA MINE
SCALE 40 FT TO 1 INCH

NOTE:- THESE APPEAR TO BE, FROM TOP TO BOTTOM, PLATES 1, 2, 3 AND 4 OF WARING.

TRINITY EXPLORATION CO.
BOX 992, SILVER CITY, N.M.
RETURN NOT REQUESTED

TITLE TRACING OF OLD ALHAMBRA MAP OF THE ALHAMBRA MINE
NOTHING ALTERED OR CHANGED
DRAWN BY TRACED BY R. DYER CHECKED BY
SCALE AS SHOWN DATE 1-23-53
ISSUE

1 3-17-53

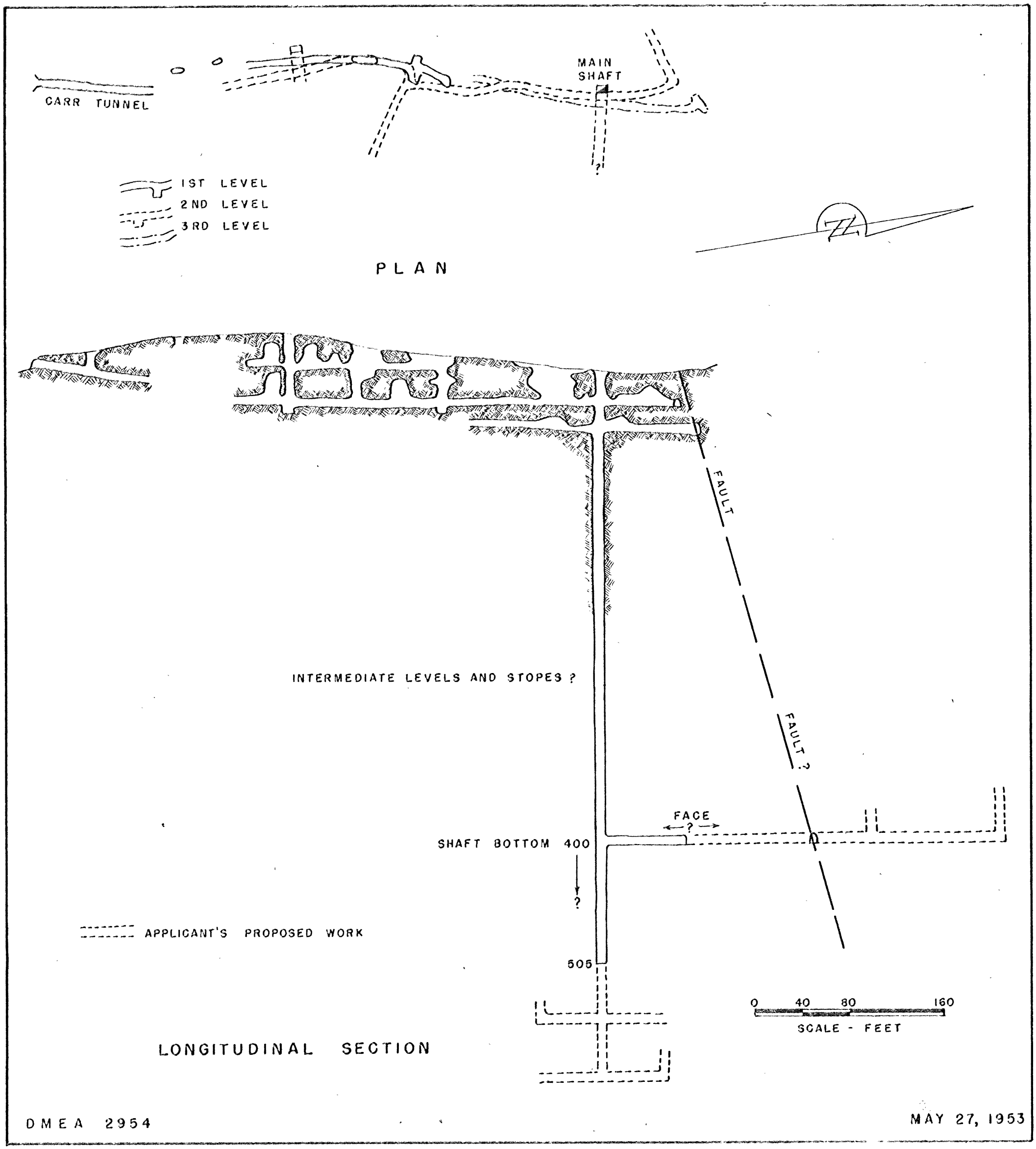
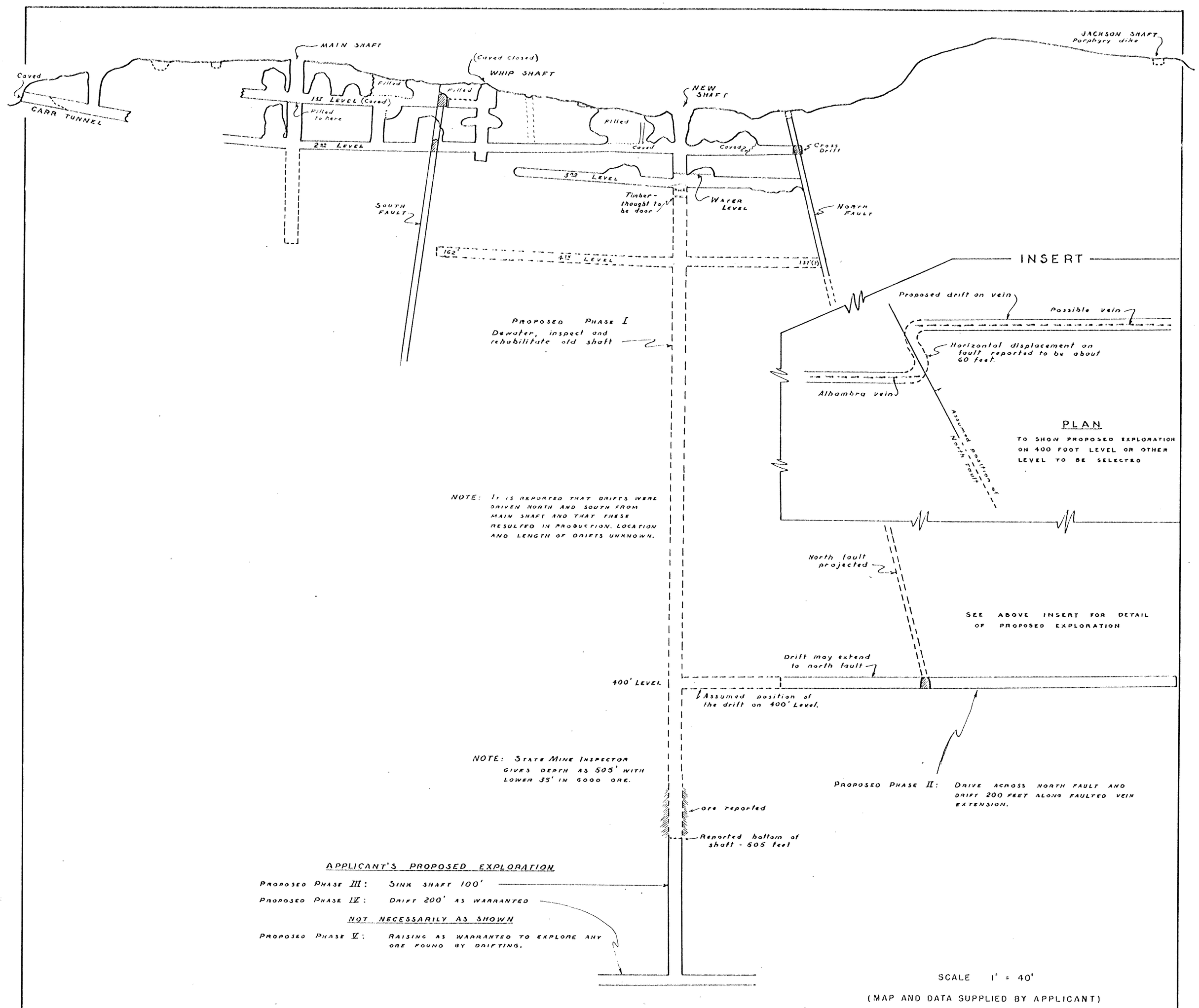


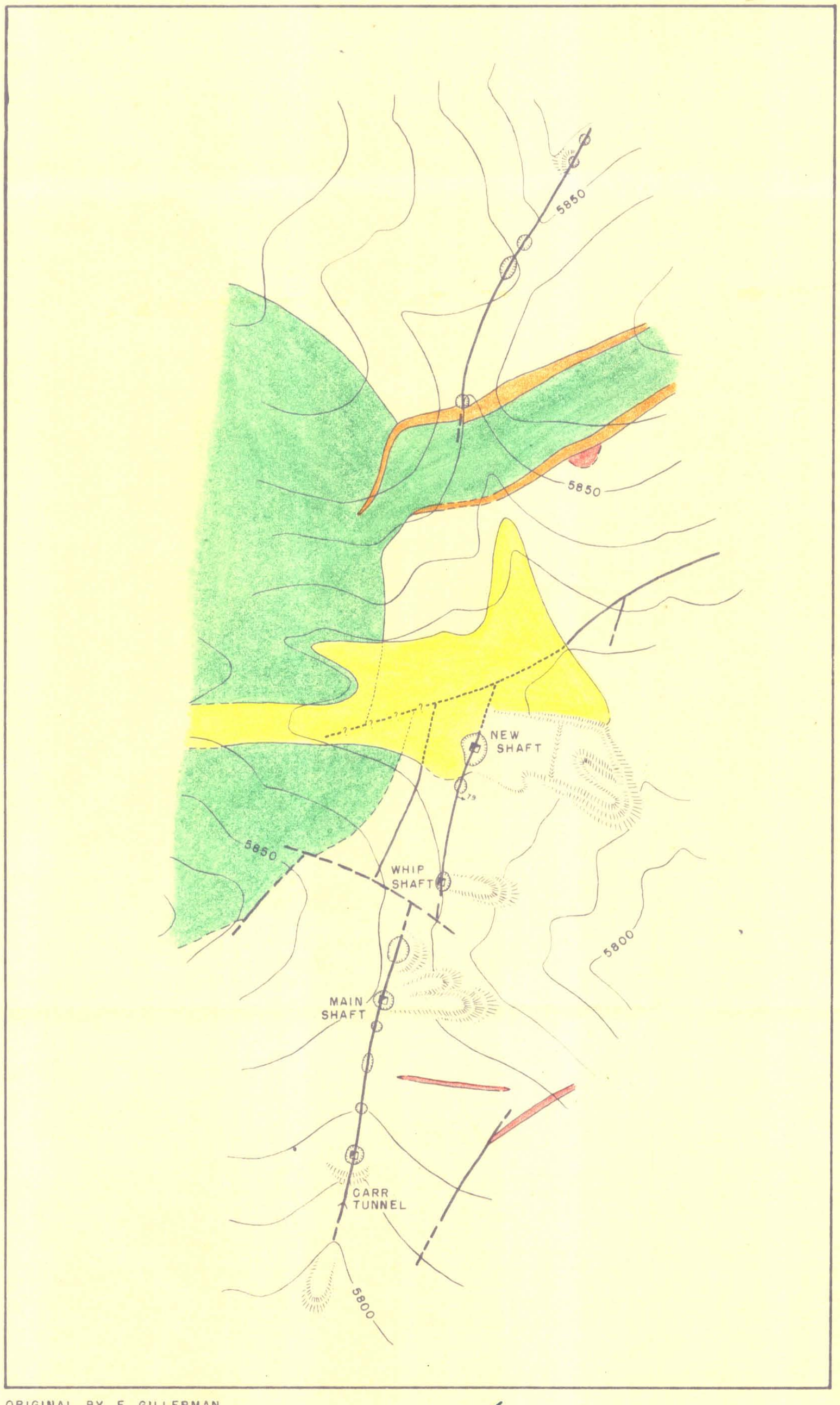
FIGURE 3.- ALHAMBRA MINE WORKINGS & PROPOSED PROJECT



JUNE 1953 DMEA 2954

FIGURE 5. - LONGITUDINAL PROJECTION SHOWING POSSIBLE EXPLORATION

ALHAMBRA MINE BLACK HAWK DISTRICT GRANT COUNTY, NEW MEXICO



ALLUVIUM

MONZONITE PORPHYRY

RHYOLITE

GRANITE

GRANITE GNEISS

FAULT, SHOWING DIP
(DASHED WHERE APPROXIMATELY LOCATED)

CONCEALED FAULT

CAVED SHAFT

CAVED ADIT

PROSPECT PIT

TRENCH

DUMP

TRUE NORTH 13°

0 100 200 FEET

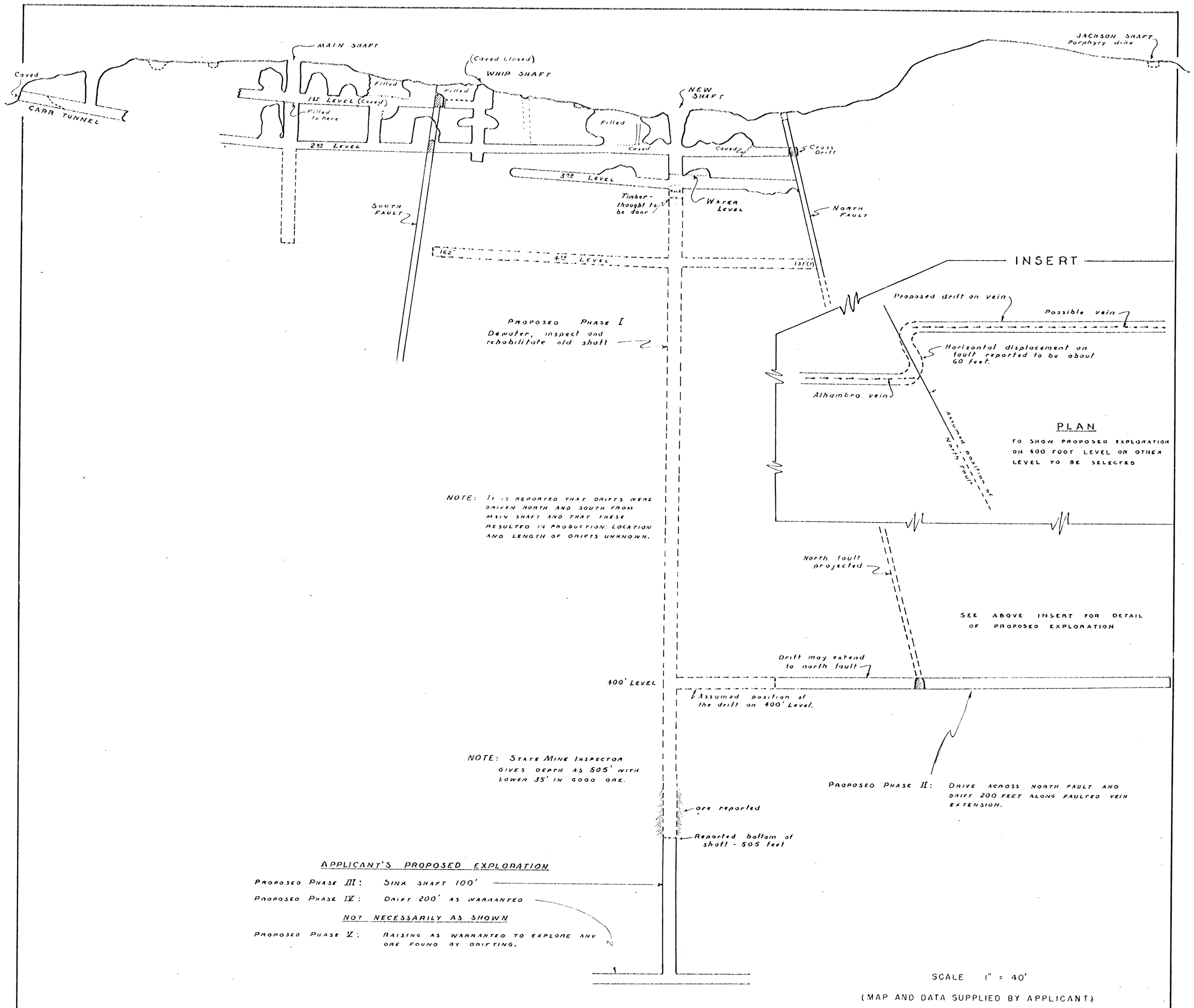
CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

DMEA 2954

ORIGINAL BY E. GILLERMAN
D. H. WHITEBREAD

Figure 4

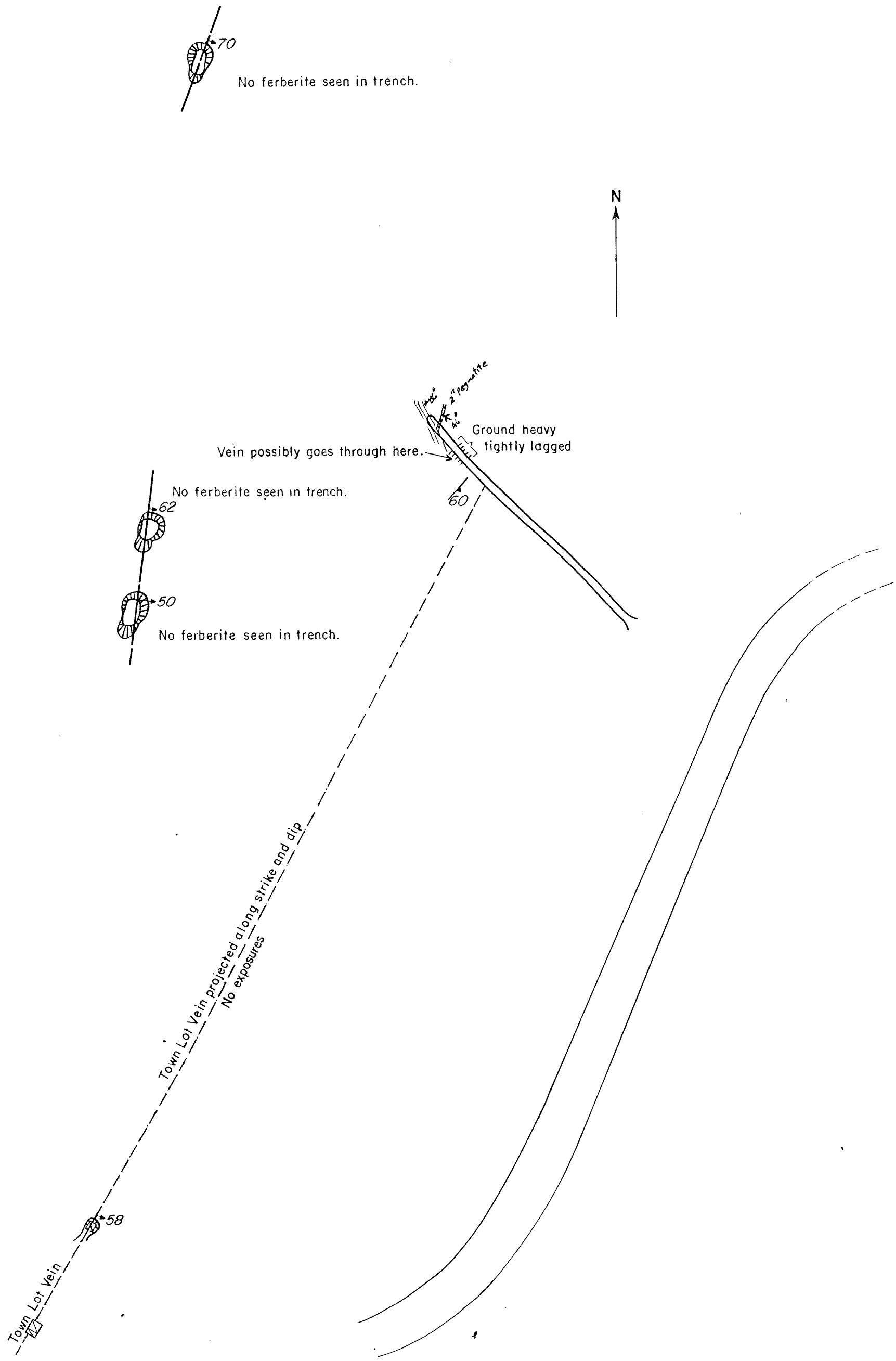
GEOLOGIC MAP OF THE ALHAMBRA MINE AND VICINITY
GRANT COUNTY, NEW MEXICO



JUNE 1953 DMEA 2954

FIGURE 5. - LONGITUDINAL PROJECTION SHOWING POSSIBLE EXPLORATION

ALHAMBRA MINE BLACK HAWK DISTRICT GRANT COUNTY, NEW MEXICO



By D. R. MacLaren, April 1953

FIG. 2- MAP OF ROOSE TUNNEL SHOWING RELATION TO TOWN LOT AND OTHER VEINS

50 25 0 50