☐ Audited [redacted] ANALYSIS SHEET - DMEA PROJECT [redacted] ☐ Actual Cost

☐ Certified Analysis as of _____ ☒ Agreed Unit Costs
Incl. Voucher for _____

Name Hetzer Mines, Inc. Docket No. DMEA-2810

State Colorado Commodity Tungsten Idm-E No. 592

OPERATION	AUTHORIZED Units	AUTHORIZED Cost	COMPLETED Units	COMPLETED Cost	NET COST
Drifting & Crosscutting					
Raising					
Shafts					
Winzes					
Drilling (Specify) Diamond. Ex & AX	3,800'	30,400.00			
Surface Excavation					
Underground Excavation					
Roads and Trails					
Operating Equipment Purchased					
Surface Rehabilitation & Repairs					
Underground Rehabilitation					
New Building, Improvements, etc.					
Other (Specify)					
Totals		30,400.00			

Before any work was started contract was rescinded

Prepared by TLC

71626

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

224 New Customhouse
Denver 2, Colorado

December 11, 1953

WSM

Memorandum

To: C.O. Mittendorf, Administrator, DMEA

From: Executive Officer, DMEA Field Team, Region IV

Subject: Docket DMEA 2810 (Tungsten), Contract Idm-E592, Hetzer Mines, Inc., Boulder County, Colorado

Enclosed are the original and two copies of "Rescission of Exploration Project Contract by Agreement Before Work is Begun" which has been executed in conformance with authority contained in a teletype from the Acting Chairman of the Operating Committee dated November 24, 1953. Also enclosed are three sets of data relevant to the termination agreement.

Copies of this agreement have been given to the operator, the Fiscal Officer, Region IV, and a copy has been retained for our files.

W H King
W. H. King

Enclosures

Rescission of Contract

VISION COPY

RESCISSION OF EXPLORATION PROJECT CONTRACT
BY AGREEMENT BEFORE WORK IS BEGUN

It is agreed this 1st day of December, 1953, between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, hereinafter called the Government, and Hetzer Mines, Inc., hereinafter called the operator, parties to that certain Exploration Project Contract No. Idm-E592, Docket No. DMEA 2810, dated August 31, 1953, that said contract shall be and is hereby rescinded, revoked, and cancelled as of the date of the contract, before any actions have been taken or costs incurred thereunder, without any obligation whatever, one party to the other, the same as if said contract had never been entered into.

Witness the following signatures as of the day and year first above written.

HETZER MINES, INC.
(Operator)

By Elmer Hetzer
Elmer Hetzer, President

UNITED STATES OF AMERICA

By W H King
W.H. King, Executive Officer
DMEA Field Team, Region IV

C
O
P
Y

GOSS & HUTCHINSON
Attorneys at Law

Boulder, Colo.
Nov. 20, 1953

Mr. W. H. King
Executive Officer, DMEA
224 New Customhouse
Denver 2, Colorado

Re: Docket No. DMEA 2810 (Tungsten), Contract Idm-E592
Hetzer Mines, Inc.

Dear Mr. King:

I thank you for your letter of November 17th, 1953. I have discussed this matter with Mr. Elmer Hetzer, President of Hetzer Mines, Inc. and he feels that it would not be entirely fair for us to fix a day within which we could commence operations under this contract. In view of the fact that we might not be able to proceed he does not think that we ought to ask for an extension of the contract. We appreciate your assistance very much and are sorry that we were not able to operate under the contract.

Yours very truly,

(signed) Dudley I. Hutchinson

224 New Customhouse
Denver 2, Colorado

November 17, 1953

Mr. Ludley I. Hutchinson
Goss & Hutchinson
Attorneys at Law
Boulder, Colorado

Re: Docket No. DMEA 2810
(Tungsten), Contract
Idm-E592
Metzer Mines, Inc.

Dear Mr. Hutchinson:

Reference is made to your letter of November 14, 1953 wherein you advised that it will be impossible to commence operations under the referenced contract within the sixty (60) day period stipulated under Article 3 of the contract.

Upon receipt of a request from you stating the exact period necessary before operations can be commenced we will prepare an Amendment to the contract to effect the change.

Please furnish this office with the original and five copies of any request for Amendments to the contract.

Very truly yours,

J. W. Townsend, for
W. H. King
Executive Officer, DMEA
Field Team, Region IV

JWT:fwo

cc WMTraver
JWTownsend
Contract
Baron
Moschman (2)

GOSS & HUTCHINSON
Attorneys at Law

November 14, 1953

Mr. W. H. King
Executive Officer DMEA
224 New Custom House
Denver 2, Colorado

Dear Mr. King:

I am writing you as Secretary of Metzer Mine, Inc., relative to the Exploration Project Contract No. Idm-E592, Docket No. DMEA-2313, which you forwarded to me in your letter of August 31, 1953.

Mr. Elmer Metzer, President of Metzer Mine, Inc., advises me that it was impossible for us to commence operations within the sixty day period and has asked me to write you to inquire whether or not this contract can be renewed or extended granting us additional time to start operations.

Thanking you, I am,

Yours very truly,

(Signed) Dudley I. Hutchinson

Dudley I. Hutchinson

DIH/bc

DEFENSE MINERALS EXPLORATION
ADMINISTRATION

5284 Rustle Agm/Rec 3538

1L3923.970, Working Fund - DMEA
November 24, 1953

W. H. KING, DMEA EXECUTIVE OFFICER, REGION 4, DENVER 2, COLORADO

REURTT NOVEMBER 23, 1953, AUTHORITY TO RESCIND CONTRACT NO. IDM-3592 HEITZER MINES, INC., DOCKET NO. DMEA 2810. AUTHORITY GRANTED BECAUSE OPERATOR HAS REQUESTED RESCISSION BEFORE WORK IS BEGUN.

W. S. Martin
ACTING CHAIRMAN, OPERATING COMMITTEE

CC: Docket
Code 100
FT. REG. 4 - CONFIRMATION
Operating Comm.
Admr. Reading File
Audits Div. - B/M
R. W. Cashman, B/M
T. P. Thayer, G/S

SENT
NOV 24 1953
Clerical Service Section

400

C
O
P
Y

DN 235 BUREAU MINES 11/23/53 3:32 PM

C O MITTENDORF

RE DOCKET DMEA 2810, CONTRACT IDM-E592, TUNGSTEN, HETZER MINES, INC., WE HAVE RECEIVED A LETTER FROM OPERATOR'S AGENT TO THE EFFECT THAT THEY DO NOT KNOW WHEN THEY WILL BE ABLE TO COMMENCE WORK UNDER THIS CONTRACT, IF EVER, AND INDICATE A DESIRE THAT THE CONTRACT BE RESCINDED BEFORE START OF ANY WORK. PLEASE TELETYPE AUTHORITY FOR US TO RESCIND THE CONTRACT.

W. H. KING

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
SEP 8 - 1953

224 New Customhouse
Denver 2, Colorado

September 3, 1953

WSM

Memorandum

To: Secretary to the Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region IV

Subject: Docket No. DMEA 2810 (Tungsten), Contract Idm-E592, Hetzer Mines, Inc., Boulder County, Colorado

Enclosed are four copies of the final report on Docket No. DMEA 2810. A contract has been prepared and is in effect.

W. H. King

W. H. King

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE
9-11-53
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Mining Division
Region IV

February 19, 1953.

Memorandum

To: Field Team, Region IV

From: Chief, Mining Division, Region IV

Subject: Final Report, DMEA Docket 2810, (Tungsten) Metzer Mines, Inc., Boulder County, Colorado.

Enclosed are eight copies of the final engineering report on the subject docket.

The examining engineer recommends a diamond drilling program, subject to extension as the work progresses and is found to be warranted.

We concur in this recommendation to drill ten diamond drill holes at a total cost of $50,400.00, Government participation - $22,800.00

W. H. King
W. H. King

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE

9-11-53
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

REGION IV

Building 20, Room 137
Denver Federal Center
Denver 14, Colorado
February 11, 1953

Memorandum

To: Executive Officer, Field Team, Region IV

From: Chief, Mineral Resources Branch, Mining Division, Region IV

Subject: DMEA 2810 (Tungsten), Metzer Mines, Inc. (Clyde, Gab, and Lily mines), Boulder County, Colorado

Please find enclosed the original and eight copies of an engineering report, by Carl Balser, on the above docket. The "Summary, Conclusions, and Recommendations", by Ogden Tweto and Carl Balser, is being typed by the Geological Survey for submission.

Balser considers the area to be explored by diamond drilling merits the expenditure to complete a definite 2,250 feet of hole, with a possibility of an additional 1,550 feet depending on results as the work progresses. If the total 3,800 feet of drilling is completed, the estimated cost will be $30,400.00.

For obvious reasons, drilling larger diameter holes is suggested. They should all be started BX and a minimum of AX required. The actual drilling cost is estimated at $6.00 per foot and a short-form contract with the applicant at a unit over-all cost of $8.00 per foot is suggested. This estimate is considered as low as warranted under conditions expected to be encountered.

I approve the engineer's recommendation for a tentative program, subject to verification as work progresses, limited to ten diamond drill holes totaling 3,800 feet, at a cost of $30,400.00, Government participation—$22,800.00.

Galen W. Hazen Jr.
for W. M. Traver

Enclosures

cc 8
General
Chron

Reviewed by
DMEA OPERATING COMMITTEE

9-11-53
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.
200 New Customhouse
Denver 2, Colorado

February 12, 1953

Memorandum

To: DMEA Field Team, Region IV

From: A. H. Koschmann

Subject: DMEA Docket 2810, Clyde, Gale, and Lily Tungsten Mines, Hetzer Mines, Inc., Boulder County, Colorado.

Attached are 8 copies of the geological report by Ogden Tweto and the Summary, Conclusions, and Recommendations by Ogden Tweto and Carl Belser covering DMEA Docket 2810, Clyde, Gale, and Lily Tungsten Mines, Boulder County, Colorado.

The applicant proposes to explore for tungsten ore by diamond drilling 12 holes totaling 4150 feet, estimated by the company to cost $26,191.24.

The Clyde mine is one of the large producing mines in the Boulder County tungsten district; the Gale and Lily mines are smaller. Several known veins on subject property, some moderately productive, have been inadequately explored. The veins are partly or wholly in geologically favorable hardrocks, as aplite, and the proposed holes are spotted and aimed to reach the veins where they occur in such rocks.

Tweto considers subject property favorable for discovery of additional tungsten ore shoots and recommends that an exploration loan be approved. However, he recommends that 7 holes, totaling 2250 feet, be drilled, but that provision be made for an additional 1550 feet of hole, contingent on the results of the first stage of drilling.

I concur in this recommendation.

A. H. Koschmann

A. H. Koschmann
Supervising Geologist
Colorado-Wyoming

Enclosures (8)

Reviewed by
DMEA OPERATING COMMITTEE

9-11-53
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMEA 2810, Hetzer Mines, Inc.

Clyde, Gale, and Lily Mines

Boulder County, Colorado

Tungsten

Ogden Tweto, Geologist
U. S. Geological Survey

Carl Belser, Mining Engineer
Bureau of Mines

February 10, 1953

Reviewed by
DMEA OPERATING COMMITTEE
9-11-53
(date)

CLYDE, GALE, AND LILY TUNGSTEN MINES

HETZER MINES, INC.

BOULDER COUNTY, COLORADO

DMEA DOCKET 2810

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

By Ogden Tweto, U. S. Geological Survey
and
Carl Belser, U. S. Bureau of Mines

CLYDE, GALE, AND LILY TUNGSTEN MINES
BOULDER COUNTY, COLORADO

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The Clyde mine, two miles northeast of Nederland, Colorado, is one of the major mines of the Boulder County tungsten district, having produced about 33,000 units WO_3 from ferberite ores averaging about 3.5% WO_3. The Gale and Lily mines are smaller mines north of the Clyde. Hetzer Mines, Inc., owner of a large group of claims on which these mines are situated, has submitted an application for a DMEA loan for a project providing for 12 exploratory diamond drill holes, totaling 4150 feet, estimated by the company to cost $26,191.24.

Although the Clyde vein itself is well-explored and appears to be worked out, the area warrants further exploration because:

1. Several veins are known north and south of the Clyde vein and in the Lily tunnel, in the footwall of the Rake-off vein, and there may be others in covered areas. Some of these veins have been moderately productive, and a little ferberite shows in present exposures of others, but all these veins have been inadequately explored.

2. The Clyde and Rake-off veins have been highly productive; subsidiary veins in their walls therefore stand a better chance of being productive.

3. Insofar as it can be projected, the geology is favorable; that is, the veins are partly or wholly in hard rocks such as aplite, and the proposed holes are aimed to reach the veins in such rocks, in contrast to schist, in which the veins are generally weak and gougy.

The applicants planned to fan out three holes from each of four stations in the Clyde and Gale mines. This program has been modified somewhat, two holes being eliminated, and three more put on a "possible" or contingent basis. Thus it is recommended that 7 holes, totaling 2250 feet, be drilled definitely, and that in addition, provision be made for a maximum of 1550 feet of "possible" hole, contingent on the results of the other drilling, making a total of 3800 feet of drilling (no smaller than AX holes). This, with attendant costs, is estimated to cost $30,400, of which the Government's share would be 75%, or $22,800. An exploration loan in this amount is recommended for approval.

CLYDE, GALE, AND LILY TUNGSTEN MINES

HETZER MINES, INC.

BOULDER COUNTY, COLORADO

DMEA DOCKET 2810

Geologic Report

By Ogden Tweto
U. S. Geological Survey
Denver, Colorado

CLYDE, GALE, AND LILY TUNGSTEN MINES
BOULDER COUNTY, COLORADO

The Clyde tungsten mine is in Sherwood Gulch, two miles northeast of Nederland, Boulder County, Colorado. It is one of the major mines of the Boulder tungsten district, having produced about 33000 units WO_3 in ferberite ore averaging about 3.55 WO_3 from 1907 through 1929. The mine was closed from 1929 to 1952, when it was reopened by Hetzer Mines, Inc., the owner. Access to the mine is through a 1200-foot crosscut tunnel, which constitutes the third level of the Old, or Surface, or Hanging Wall shaft. An underground shaft extends from the tunnel level to the 7th level, about 300 feet below the tunnel. Most of the workings are in poor shape and are inaccessible; the underground shaft is in good condition, however, and the operators have rehabilitated parts of the 3d and 7th levels.

The Gale mine is a small one opened by a shaft about 100 feet deep, with one level; it lies about 100 feet northeast of the portal of the Clyde Tunnel. The Lily tunnel is opposite the Clyde portal, on the north side of Sherwood Gulch; it is a crosscut tunnel with 4 or 5 short lateral drifts on veins. The Gale has produced about 7000 units WO_3, and the Lily about 3200 units, making the total output from the Clyde-Gale-Lily Group, including minor production from several prospects nearby, approximately 43000 units. The Rake-est mine, which lies just west of the Lily Tunnel, has produced an additional 25000-30,000 units.

Hetzer Mines, Inc., owner of this property, has applied for a DMEA loan for an exploratory drilling project estimated by the applicants to cost $26,191.24.

All the claims shown in figure 1 are owned by the applicants; ground west of the claims and the section line is covered by agricultural patents owned, in the south, by the Colorado Tungsten Corporation, and in the north, by the Vanadium Corporation of America.

GEOLOGY

The chief vein of the area is the Clyde, which is actually two veins, the Hanging Wall vein, extending from the surface to the tunnel level, and the Footwall vein below the tunnel level. The Hanging Wall vein contained a large and rich ore shoot above the tunnel and east of the Old Shaft. The Footwall vein contained a much larger but somewhat lower-grade ore shoot extending from the tunnel level down to the 7th level, where it apparently ends. The rock in the upper part of the mine is aplite; this is underlain by schist, the contact of which pitches westward at about 30°, from the eastern end of the workings on the tunnel level down to the 7th level. The long ore shoot on the Footwall vein lay in the aplite just above this contact and extended down through the entire length of the mine, through a length of several hundred feet. Both the Hanging and Footwall veins have been thoroughly explored out to where they begin to die out in schist, and there is little room for exploration on these veins.

The most promising areas for further exploration are in the walls of the Clyde vein. Several veins are known in the walls, either at the surface or in the crosscut tunnel (fig. 1), and others may be present. It is such veins that the applicants propose to investigate by drilling.

The applicants have proposed to drill 12 holes totaling 4150 feet—three holes from each of 4 stations, one on the 7th level of the Clyde,

one on the Clyde tunnel level, and two in the Gale mine, as shown in figure 1. In view of the presence of several known veins, the possibility of other veins in covered or unexplored areas, the general lack of exploration in the areas proposed for drilling, the presence of at least a little ferberite on many of the known veins, and the high productivity of the Clyde vein, such exploration is warranted, although some modification of the plans for drilling is desirable, as noted below.

STATION 1

From station 1, on the 7th level of the Clyde mine, the applicants propose to drill three flat AX holes in a general northwesterly direction to explore the Occidental, Red Pine, and, particularly, the Gale, veins at depth. It is here proposed, with the approval of Messrs. Hetzer and McCoy of Hetzer Mines, to move this drill station up to the 6th level shaft station, which is amply large, for two reasons: (1) The proposed drill station on the 7th level is just about on the schist-aplite contact, and the proposed holes trend about parallel to the contact as exposed in the drift. It is therefore possible or likely that the holes would reach the veins where they are in schist and consequently may be barren. By moving up to the 6th level, 98 feet higher, the possibility of encountering schist should be greatly reduced. (2) The 7th level is relatively deep and was not highly productive; there is no need to drill at such depth when the block in question remains unexplored all the way up to the tunnel level.

Of the three holes proposed, only two are recommended, as the lefthand hole would reach the Gale vein, the main target, too close to the property

line, or possibly even across the line. It is difficult to anticipate the position of the Gale vein within 50 feet at this depth because the dip of the Gale is so erratic in the present exposures, ranging from 65°-85° NW., and even dipping 78° SE. at the northeast end of the Gale workings. Similarly, the dip of the Occidental vein is imperfectly known, although to the NW. There is some doubt that the rather small and weak Red Pine vein is present in this area, as it cannot be identified with certainty in the crosscut tunnel, although it might pick up west of a zone of irregular fractures exposed in the tunnel.

In summary, it is proposed that not more than 2 holes be drilled from station 1. Hole 1-1 (Fig. 1), pointed up at 5°, should be drilled first, and would have a maximum length of 500 feet. If it yields poor results, i.e. either poor and weak veins or soft schist country rock, no more drilling need be done here. If it yields promising results, hole 1-2, to a maximum length of 400 feet, might be drilled.

STATION 2

The applicants propose to drill three flat holes, each 300 feet long, in a general southerly direction from station 2, on the tunnel level. Drilling in this direction is warranted because the Lone Jack and Blue Chip veins show some ore and have been worked in a small way at the surface, but have not been worked at depth, except that the Lone Jack has been cut at the end of a crosscut about 175 feet west of the proposed holes. There it contains about a half-inch stringer of ferberite. The Lone Jack was probably cut also in a crosscut in the footwall on the 4th level; as this crosscut is now inaccessible, nothing is known of the vein there, but

absence of drifts, according to old maps, suggests there was no ore there. As there is considerable vein quartz and a little ferberite in the wash on the slope south of the Clyde mine, and particularly south of the Lone Jack vein, it is possible that other veins are present in addition to the Lone Jack and Blue Chip.

It is recommended that the holes from station 2 be pointed up at 5°, for easier drilling. Holes 2-1 and 2-2 (fig. 1) should be drilled first, each 300 feet long. Depending on results obtained from these, hole 2-3, might be drilled, to a maximum of 300 feet.

STATION 3

The applicants propose to drill 3 holes, two of 500 feet and one of 600 feet, all pointed down at 10°, in a northwesterly direction from station 3, in the Gale mine. The purpose is to explore the veins of the Lily tunnel at greater depth and east of the tunnel; to explore the Rake-off vein, which was highly productive in the Rake-off mine, just west of the Lily tunnel, and to explore the covered area under Sherwood Gulch.

Some objections to this program can be seen immediately. In the first place, the left hole should be discarded because it would intersect most of the veins beyond the property line. The middle hole, as aimed by the applicants, would cut through a shaft 75 feet above the bottom. The Rake-off vein has a schist hanging wall and is barren at the breast of the Lily tunnel, and, lower down and a little to the west, is barren at the east ends of the 2d and 3d levels of the Rake-off mine.

However, there are also arguments in favor of drilling here which probably justify one or two holes. (1) The covered area under Sherwood Gulch is well worth exploration, as numerous, closely-spaced productive

veins are known on each side of the gulch, and the 250-300 width of the gulch marks an unexplored blank area in the midst of this cluster of veins. (2) Although the veins of the Lily tunnel were at best only moderately productive, they were explored for only short distances, practically all on the west side of the tunnel, as the tunnel and all work from it was motivated by the high productivity of the Rake-off mine, just west of the property line. The area north of Sherwood Gulch, running east and west for almost two miles, is characterized by numerous veins, by a mixed country rock made up of north-trending strips of schist, aplite, and pegmatite, and by numerous ore-bodies--mostly small but several very important large ones--localized where the veins cross aplite or pegmatite ribs in the schist. In view of these relations, and the known presence of at least four veins in addition to the Rake-off in the Lily tunnel, exploration east of the tunnel offers some promise. (3) Although the Rake-off vein is barren in the Lily tunnel, it is a strong vein at the surface east of the tunnel, where it is in granite and aplite; in light of the geologic relations mentioned above, and the very high productivity of the vein in the Rake-off mine, exploration by at least one drill hole seems warranted as a wildcat venture.

Accordingly, it is recommended that hole 3-1 (fig.1) 850 feet long and pointed down at 10°, be drilled from station 3 to the Rake-off vein. If this gives favorable results, a second hole No. 3-2, 600 feet long, might be drilled, or, depending on the locations of areas to be explored further, the footage might be used for drilling shorter holes from the surface.

STATION 4

The applicants propose to fan out three flat 300-foot holes southward from station 4, in the Gale mine. This is desirable because it would explore

the Red Pine and Occidental veins about 100 feet lower than the workings on them in the Clyde Tunnel, and also would explore a wide zone of small veins and ferberite stringers that has been worked extensively at the surface between the Gale shaft and the portal of the Clyde tunnel.

The center hole, no. 4-1 (fig. 1) should be drilled first, to the Occidental vein, up at 5° and about 300 feet long. If this hole should show the Occidental and Red Pine veins to be unpromising at this depth, the other two holes, nos. 4-2 and 4-3, might be shortened to 175 feet, just long enough to explore the vein zone east of the Clyde portal. On the other hand, if hole 4-1 warrants, holes 4-2 and 4-3 might be extended to 300 feet.

CONCLUSIONS

Several little-worked veins north and south of the Clyde vein and in the footwall of the Rake-off vein warrant further exploration both because of the high productivity of the Clyde and Rake-off veins, and because some ore has been produced from several of the veins. Exploration by drilling, all things considered, is probably the best way to test these veins because of the relatively low cost compared to cost of exploration by mining, even though past experience in this district has shown that drilling is not entirely satisfactory. As with any drilling project of this kind, it is impossible to anticipate conditions and thus to plan the drilling in detail in advance. Plans must be modified as drilling progresses and information is obtained. However, it is necessary to plan some sort of program in order to make a cost estimate and general appraisal. Accordingly, the applicant's program providing for 12 holes totaling 4130 feet has been modified as explained above and as summarized in the table below. In each of the four localities proposed for drilling, one or two holes are classed

as "Definite," to get information by which the advisability of other holes, classed as "Possible", can be evaluated.

	Definite	Possible
Station 1		
Hole 1-1	350 feet	
Hole 1-2		400 feet
Station 2		
Hole 2-1	300	
Hole 2-2	300	
Hole 2-3		300
Station 3		
Hole 3-1	650	
Hole 3-2		600
Station 4		
Hole 4-1	300	
Hole 4-2	175	125
Hole 4-3	175	125
TOTAL	2250	1550

Thus 7 holes totaling 2250 feet are classed as "definite," and 3 holes, and possible extensions of two of the "definite" holes, all totaling 1550 feet, are classed as "possible." Although it is unlikely that all of the "possible" drilling will be done, provision must be made for it, or a grand total of 3800 feet, in preparing an estimate of maximum costs.

In the accompanying engineering report, the cost of such a project--10 holes totaling 3800 feet, plus attendant costs is estimated to be $30,400.

RECOMMENDATIONS

A program of diamond drilling providing for a maximum of 10 holes totaling 3800 feet to explore veins in the Clyde-Gale-Lily area is recommended for approval. The estimated cost is $30,400, of which the Government's share would be 75%, or $22,800. A loan in this amount is recommended for approval.

DMEA 2810

HETZER MINES, INC.
CLYDE, GALE, AND LILY MINES
BOULDER COUNTY, COLORADO

Engineering Report

By Carl Belser
Mining Engineer
Bureau of Mines

DMEA 2810

HETZER MINES, INC.
CLYDE, GALE, AND LILY MINES
BOULDER COUNTY, COLORADO

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ILLUSTRATIONS

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DMEA 2810

HETZER MINES, INC.
CLYDE, GALE, AND LILY MINES
BOULDER COUNTY, COLORADO

ENGINEERING REPORT

By

Carl Belser

INTRODUCTION

The Hetzer Mines, Inc., owner of the Clyde, Gale, and Lily mines located about 2 miles northeast of Nederland, Colo., has applied for a Defense Minerals Exploration Administration loan to explore these properties for tungsten. The applicant submitted a proposal estimated to cost $26,191.24 (Government participation—75 percent, or $19,643.43) to explore several veins, known to have produced tungsten ore in the past, at points which are not possible to examine from surface or from existing workings.

The proposal called for the preparation of four underground diamond drill stations and the completion of 4,150 feet of AX core-hole drilling.

ACKNOWLEDGMENTS

Project proposals and anticipated over-all drilling costs were discussed with engineers of the Bureau of Mines familiar with similar core-drilling operations in the main tungsten area of Boulder County.

The plan of the underground workings of the Clyde, Gale, and Lily mines was taken from a report by Ogden Tweto, geologist, U. S. Geological Survey.

LOCATION, TOPOGRAPHY, AND PHYSICAL FEATURES

The Clyde and Gale mines are located on the south side of Sherwood Gulch and the Lily mine is on the north side of the gulch. These mines are all in the NW 1/4 sec. 7, T. 1 S., R. 72 W., sixth principal meridian, in the Grand Island Mining District, Boulder County, Colo. (fig. 1). State Highway 160 passes between the Lily and Gale mines. Nederland, population—300, is 18 miles west of Boulder, a commercial center 29 miles northwest of Denver. The nearest railheads are at Rollinsville, which is 7 miles south of the property and is a station on the main line of the Denver and Rio Grande Western Railroad, and at Boulder, on the Union Pacific and Colorado and Southern Railroads.

The tungsten district is located on the eastern slope of the Colorado Front Range at altitudes ranging between 6,000 and 9,000 feet. It is an area of rounded mountain tops and flat ridges, separated by deep gorges which dissect the terrain. The altitude at the portal of the Clyde tunnel is 8,261 feet. Although the winters are somewhat severe, the main roads are kept open and interruptions to year-around operations are few. Timber in the vicinity is suitable for most types of mining. The nearest permanent stream flows down Sherwood Gulch. Both the Gale shaft and the Clyde mine are connected to the service lines of the Public Service Company of Colorado. Housing facilities are available in Nederland.

HISTORY AND PRODUCTION

Tungsten was discovered near Nederland in 1899 and ferberite was first mined in 1900. The largest yearly production from the

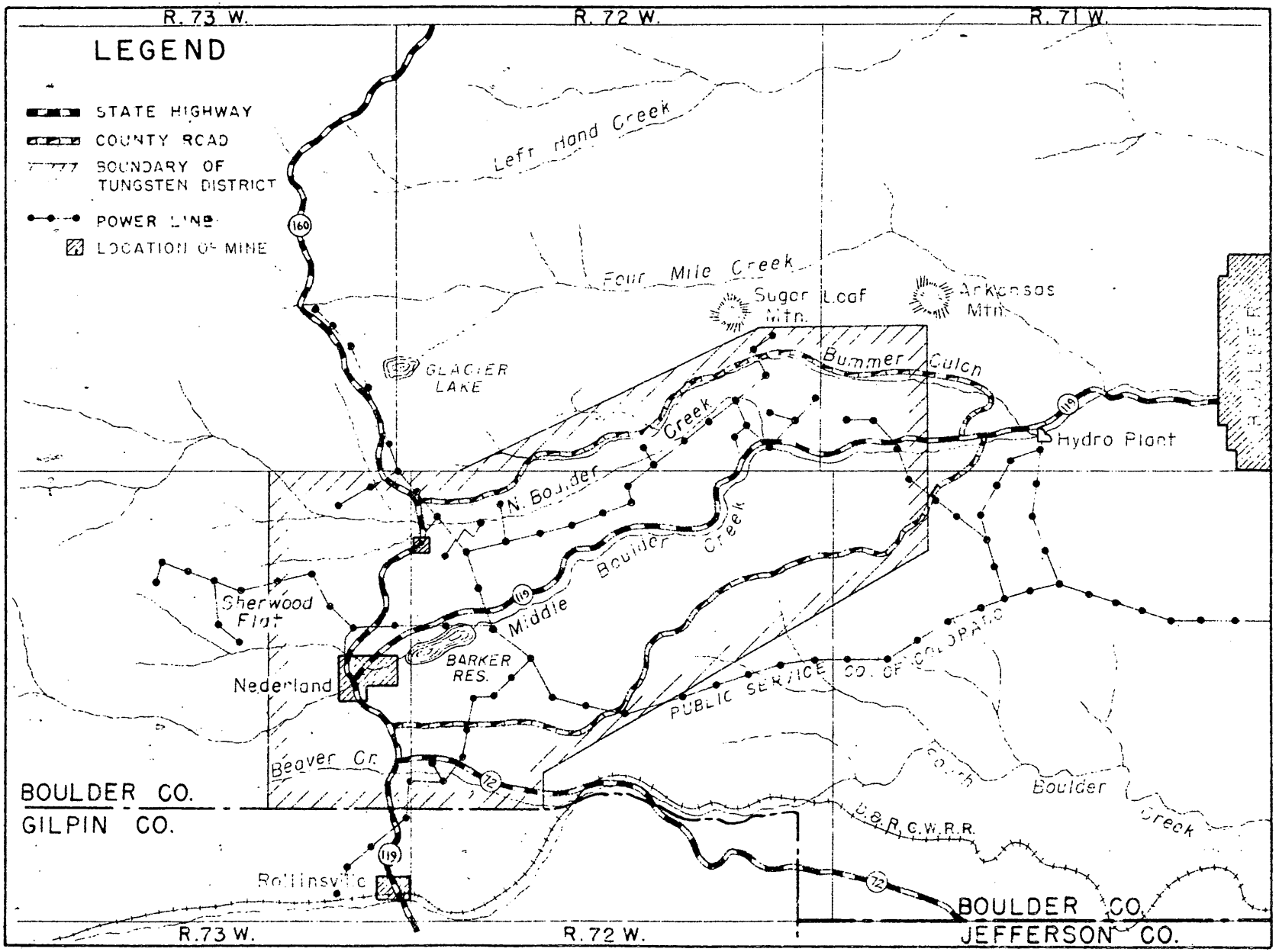


Figure 1 - Location map, Clyde-Gale-Lily tungsten mines, Boulder County, Colorado - DMEA 2810

district (2,707 tons of 60 percent WO_3) was in 1917 when the price reached a high of $105.00 a unit. Beginning with the year 1918, production rapidly declined and was at a low in 1950. Total production for the district through 1950 is estimated as 24,000 short tons (1,440,000 units) of 60 percent WO_3 concentrates.

The Clyde-Gale-Lily group included in the application contains eighteen claims, each of which has at least one vein. Discovery was made and mining began in the early nineteen hundreds and the greater part of the production was made prior to 1918. The Clyde mine was operated through 1929 and was closed from 1929 to 1952. The Gale and Clyde mines were reopened by Hetzer Mines, Inc., the present owner, in 1952.

The production record through 1951 from the Clyde-Gale-Lily group is reported by the applicant in the following table:

Mine	Production		
	Tons of ore	Percent WO_3	Units WO_3
Clyde	7,962	3.6	33,612
Gale	385	19.12	7,358
Lily	131	28.51	3,741
Red Pine	4.6	24.33	112
Red Spruce	2.6	25.10	65
Lone Jack	7.4	4.46	33
Blue Chip	No recorded production		There is evidence that small productions were made from some of these mines.
McKenna	" "	"	
Laura	" "	"	
Eliza	" "	"	
Hidden Fortune	" "	"	
Pinto	" "	"	
Cypress	" "	"	
Ash Pan	" "	"	
Slide	" "	"	
Occidental	" "	"	
Gulch	" "	"	
Luck Bill	" "	"	
Total	8,492.60	5.3	44,920
Total Production for 1952	526.5	1.43	750

The Rake-off mine, 200 feet west of the Lily mine, has produced between 25,000 and 30,000 units of tungsten.

OWNERSHIP AND EXTENT

The Clyde-Gale-Lily group comprises eighteen patented claims, forming a nearly solid block of ground approximately 1,800 feet long from north to south and 1,230 feet wide from east to west. The patented claims are:

Claim	Survey Number	Claim	Survey Number
Hidden Fortune	19,171	Red Spruce	18,340
Lily	19,171	Red Pine	18,340
Pinto	19,171	Occidental	18,340
Laura	19,171	Gulch	18,340
Eliza	19,171	Clyde	18,340
Ash Pan	18,340	Lone Jack	18,340
Cypress	18,340	Blue Chip	18,340
Slide	18,340	McKenna	18,340
Gale	18,340	Luck Bill	19,952

The claims are owned by the applicant, Hetzer Mines, Inc.--Elmer Hetzer, President, 2045 Mapleton Avenue, Boulder, Colo.; Charles S. Mooney, Vice President, 1210 High Street, Boulder, Colo.; Dudley I. Hutchinson, Secretary, 943 Broadway, Boulder, Colo; and Abram A. McCoy, Treasurer, 845 Lincoln Place, Boulder, Colo.

The applicant states that the property involved is free of any liens or encumbrances.

DESCRIPTION OF THE DEPOSITS

Several steeply dipping veins strike northeast across the property. Most of these veins are exposed on surface and at least eleven of the veins have been cut by the workings of the Clyde, Gale, and Lily mines. The Gale shaft is 620 feet north of the Clyde shaft

and the Lily shaft is 500 feet northwesterly of the Gale shaft. The known veins are the Blue Chip, Lone Jack, Clyde Footwall, Clyde Hanging Wall, Occidental, Red Pine, Red Spruce, Gale, Ash Pan, Lily, and Rake-off. Other veins may exist, especially in the area between the Gale shaft and the Lily tunnel.

In the upper part of the Clyde mine the country rock is aplite and is underlain by schist. The schist-aplite contact pitches west about 30°. The ore shoot on the footwall vein is in aplite just above the contact with the schist. Both the hanging and footwall veins have been well explored, and the footwall vein has been worked to the 700-foot level. A promising area for further exploration is in the walls of the Clyde vein. The Gale vein has been worked to a depth of 110 feet. The country rock is aplite and a large ore shoot occurred at the junction of two veins, just to the northeast of the Gale shaft. The Lily is opened by a short tunnel and a 150-foot underground shaft. The tunnel cuts at least five veins.

In all the known deposits in the Clyde-Gale-Lily group, the ore occurred as lenses of ferberite in veins where the wall rocks were granite, pegmatite, or aplite. In a large portion of the workings the walls can be classified as moderately firm.

MINEABLE ORE RESERVES

The only known ore reserves at this time consist of a small streak on surface near the portal of the Clyde tunnel, a small block on the Gale vein about 70 feet west of the shaft, some shaft pillars in the Clyde mine, and the Clyde dump. It is reported that

the bottom of the "glory hole" in the Gale mine is in ore. No attempt is made to evaluate the reserves, but it is expected 1953 production should about equal that of 1952, or 750 units.

PRESENT STATUS

Exploration and Development

The mine workings are shown on the accompanying map (fig. 2).

The applicant has rehabilitated the Gale shaft, Clyde tunnel, Clyde footwall shaft, and the Clyde fourth and seventh levels to the southwest. The Clyde vein, southwest of the shaft on the tunnel level, has been further prospected during the past year and 80 feet of drifting have been done on what is probably the Lone Jack vein on the fourth level in the Clyde mine.

Mining and Milling Equipment and Other Facilities

The following facilities are on the property:

Gale mine: headframe and frame hoist house, track, power lines, air lines, and pump column.

Clyde mine: frame tunnel house, track, power lines, air lines, and pump column.

The applicant has agreed to furnish the following listed equipment for the project. The value of and depreciation charge over a period of 5 months for the equipment, figured at the standard rate, are as follows:

Item	Value	5 months' Depreciation
Colorado Iron Works 15-horsepower 440-volt hoist with cable, controller, and grids	$ 1,200.00	$ 100.00
One assembled 15-horsepower 440-volt hoist with cable, controller, and grids	1,200.00	100.00
Ingersoll-Rand 25-horsepower 440-volt pump with float and magnetic switch	550.00	45.85

Item	Value	5 months' Depreciation
Fairbanks-Morse 5-horsepower 440-volt pump with float and magnetic switch	$ 250.00	$ 20.80
365-cubic-foot Gardner-Denver compressor with Model 13,000 Caterpillar engine	6,000.00	500.00
2 ore cars, 2 shaft buckets, dollies	1,000.00	83.35
	$ 10,200.00	$ 850.00

The Vanadium Corporation of America operates a custom mill for the beneficiation of tungsten ores at Nederland.

PROJECT PROPOSALS, WITH COSTS

From station 1 on the seventh level of the Clyde mine, the applicant proposes to drill three flat AX holes in a northwesterly direction to explore the Clyde hanging wall and to cut the Occidental, Red Pine, Red Spruce, and Gale veins at depth. At the suggestion of the examining team, with the approval of the applicant, this portion of the project has been modified as follows: Station 1 is to be relocated at the shaft station on the sixth level and hole 1-1 drilled N. 39° W. at an angle of +5° or less to the horizontal to a maximum length of 350 feet. Hole 1-2 should not be drilled if the core from hole 1-1 indicates poor or weak veins or soft schist country rock. The direction of hole 1-2, if drilled, will be N. 24° W. and at an angle of +5° or less with the horizontal to a maximum length of 400 feet. The modifications from station 1 have been made for the following reasons: From the available information, drilling from the seventh level may penetrate the schist below the aplite schist contact; the most westerly drill hole proposed by the applicant would reach the Gale vein too close to the property line; and holes

drilled downward at a slight angle to the horizontal are easier to drill than flat holes. Station 1 should be lengthened a few feet to the northwest to allow for 10-foot pulls during core-drill operations and will require some timbering.

The applicant proposes to drill three AX flat core-drill holes in a southeasterly direction from station 2 on the Clyde tunnel level to cut the Lone Jack and Blue Chip veins. The station will require side slabbing. The drilling from this station has been modified as follows: Hole 2-1 should be drilled S. 4° E. at an angle of +5° to a maximum length of 300 feet. This should be followed by hole 2-2, drilled S. 36° E. to a maximum length of 300 feet and at a +5° angle. If results from these two holes warrant, hole 2-3 may be drilled S. 20° E. at a +5° angle to a maximum length of 300 feet.

Station 3 is about 50 feet west of the Gale shaft on the 110-foot level of the Gale mine. The proposed station requires some cleaning up and a little timbering. The applicant proposes that three flat AX holes be driven in a northwesterly direction from this station to explore the Rake-off and four other veins which are exposed in the Lily workings and also to explore the almost unprospected area between the Gale shaft and the Lily tunnel. Drilling from this section has been modified as follows: Hole 3-1 should be drilled N. 13° W. at an angle of -10° to a maximum length of 650 feet. If the results from hole 3-1 are favorable, a second hole, 3-2, might be drilled N. 24° W. at an angle of -10° to a maximum length of 600 feet, or an equivalent footage could be assigned to short

surface drill holes. The modifications at station 3 have been made for the following reasons: The most westerly drill hole proposed by the applicant would run off the property at approximately the point where the first known vein would be cut, and the middle hole would cut the Lily shaft. The Rake-off vein has a strong outcrop east of the Lily shaft.

The applicant proposes to fan out three flat 300-foot holes to the south from station 4 in the Gale mine to explore the Red Spruce, Red Pine, and Occidental veins. This station will require a small amount of cleaning and timbering. The following modifications are made: Hole 4-1 (the center hole) should be drilled S. 20° E. to a maximum length of 300 feet at an angle of +5°. If hole 4-1 shows the Occidental vein to be unpromising at this depth, hole 4-2 should be drilled S. 4° E. to a maximum length of only 175 feet and hole 4-3 should be drilled S. 35° E. to a maximum depth of only 175 feet, both at an angle of +5°. If results from hole 4-1 warrant, both holes 4-2 and 4-3 might be extended to a maximum length of 300 feet.

A summation of the modified drilling program follows:

		Footage	
		Definite	Possible
Station 1			
	Hole 1-1	350	
	Hole 1-2		400
Station 2			
	Hole 2-1	300	
	Hole 2-2	300	
	Hole 2-3		300

		Footage	
		Definite	Possible
Station 3			
	Hole 3-1	650	
	Hole 3-2		600
Station 4			
	Hole 4-1	300	
	Hole 4-2	175	125
	Hole 4-3	175	125
	Total	2,250	1,550
	Total definite and possible footage	3,800	

The time required to complete the drilling program is estimated as 130 shifts, or 5 months, on a 30-foot-per-day basis.

The country rock in the vicinity of the Clyde vein is vuggy and some of the holes will probably require casing. This condition, together with the advantage of larger cores, makes it advisable to start all holes with BK bits and to terminate them at that same size, if feasible. In all cases the minimum size of core should be AX.

The cost of diamond drilling in this area for AX holes has averaged about $4.15 a foot. BK holes would cost approximately $4.75 per foot. This additional cost would be offset by a smaller reaming cost and larger cores. Incidental core-drilling costs, including cementing, reaming, casing, etcetera, are estimated at $1.25 a foot, making a total cost of $6.00 per foot.

Estimated Cost of Project

Diamond drilling		
Subcontract, $3,800 feet of BX and AX hole at $6.00 per foot		$22,800.00
Preparation of drill stations		
Station 1		
Slabbing off 3 feet, hoisting broken rock and timbering	$ 60.00	
Station 2		
Slabbing off side of crosscut and cleaning crosscut	40.00	
Station 3		
Cleaning drift and placing timber	30.00	
Station 4		
Cleaning drift and placing timber	30.00	160.00
Labor		
Compressor man - $1.60 per hour regular time, $2.40 per hour overtime - 130 shifts (109 and 21)	$1,798.40	
Hoistman - $1.60 per hour regular time, $2.40 per hour overtime - 130 shifts (109 and 21)	1,798.40	3,596.80
Supervision (half time)		1,250.00
Core boxes (105 at $4.00)		420.00
Electrical power (for pumping and hoisting)		520.00
Fuel oil (for compressor)		390.00
Depreciation of equipment (as shown under mining equipment)		850.00
Miscellaneous supplies and small tools		200.00
Sampling and analysis (20 at $8.00)		160.00
Compensation insurance and payroll taxes		165.41
Total estimated cost of project		$30,512.21

The above is $8.03 per foot and will require 130 shifts or 5 months, working a 6-day week, for completion. Allowing $8.00 for the cost per foot, the over-all cost for 3,800 feet of drilling is $30,400.00

Government participation in tungsten exploration projects is 75 percent, or in this case $22,800.00.

CONCLUSIONS

There are several veins in the Rake-off footwall, veins north and south of the Clyde vein, and also an unprospected area under Sherwood Gulch that merit further exploration. Although past experience with core drilling in this area has not been entirely satisfactory, preliminary exploration by that method is regarded as more satisfactory—all things considered, especially costs—than exploration by crosscuts and drifts. The tentative plan set up in this proposal must be subject to modification as additional information is secured during the progress of the core-drilling program. The applicant's program, providing for twelve holes totaling 4,150 feet, has been modified to a tentative program of ten holes totaling 3,800 feet.

RECOMMENDATIONS

A program of diamond drilling providing for a maximum of ten holes totaling 3,800 feet of BX and AX hole (all holes to be started BX and to be finished not smaller than AX) is recommended for approval. The estimated cost is $8.00 per foot or $30,400.00, the Government's share 75 percent or $22,800.00.

A contract on short form MF-200 (A) is suggested, providing contribution by the Government on the basis of the estimated costs of units of work performed.

cb

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

OFFICIAL BUSINESS

DMEA -2810 , E-592

MF-200 (A)
(February 1952)

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
SEP 4 - 1953

DOCKET NO. IEA 2810

COMMODITY Tungsten

Idm-8592

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

EXPLORATION PROJECT CONTRACT[1]
(Short Form)

IT IS AGREED this 31st day of August, 1953, between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, hereinafter called the "Government," and[2] Hetzer Mines, Inc., a Colorado corporation,
P.O. Box 150
Boulder, Colorado

hereinafter called the "Operator," as follows:

ARTICLE 1. *Authority for contract.*—This agreement is entered into under the authority of the Defense Production Act of 1950, as amended, pursuant to DMEA Order 1 entitled "Government Aid in Defense Exploration Projects."

ARTICLE 2. *Operator's property rights.*—With respect to that certain land situated in the State of Colorado, County of Boulder, described as follows:[3]
The Clyde-Gale-Lily group comprising 18 patented lode mining claims located in the Grand Island Mining District in T. 1 S., R. 73 W.
See attached Annex No. 1.

the Operator represents and undertakes:[4]

(*a*) That the Operator is the owner, in possession and entitled to possession, and that the property is subject only to the following claims, liens, or encumbrances as to each of which the subordination agreement of the holder is attached:

None

(*b*) [redacted]
The Operator shall devote the land and all existing improvements, facilities, buildings, installations, and appurtenances to the purposes of the exploration project without any allowance for the use, rental value, depreciation, depletion, or other cost of acquiring, owning, or holding possession thereof.

ARTICLE 3. *Exploration project.*—The Operator, within 60 (sixty) days from the date of this contract shall commence work on a project of exploration for[5] Tungsten

in or upon the described land; and shall bring the project to completion within a period of 7 (seven) months from the date of this contract. The work to be performed is more fully described in Exhibit "A" attached hereto, which, with any maps or drawings thereto attached, are made a part of this contract. The Government will contribute to the cost of this work as hereafter provided. The work shall be performed by the Operator or by independent contractor or contractors efficiently, expertly, in a workmanlike manner, in accordance with good mining standards and State regulations for health and safety and for workmen's compensation and employers' liability insurance, with suitable and adequate equipment, materials, and labor, to bring the project to completion within the time fixed. The Government shall have the right to enter and observe and inspect the work at all reasonable times, and the Operator shall provide the Government with all available means for doing so. The Government may consult with and advise the Operator on all phases of the work.

ARTICLE 4. *Costs of the project.*—The agreed, estimated costs of performing the work, expressed in terms of units of work to be performed (per foot of drifting, per foot of drilling, per cubic yard of material to be moved, etc.) are set forth in Exhibit "A," attached hereto. The Government will pay seventy-five (75) percent of these agreed, estimated costs, as they accrue, for units of work actually performed that conform with the description or specifications for the work set forth in this contract, in an aggregate total amount not in excess of $22,800.00, which is 75 percent of $30,400.00 the agreed, estimated total cost of the project in which the Government will participate: *Provided,* That until the Operator's final report and final accounting have been rendered to the Government and any final check or auditing required by the Government has been made, and a final settlement of the contract has been made, the Government may withhold from the last voucher or vouchers such sums as it sees fit not in excess of ten (10) percent of the maximum total which the Government might have been called upon to pay under the terms of the contract. The Government may, as it sees fit, make payments direct to the Operator's independent contractors, if any, for the account of the Operator, rather than to the Operator.

ARTICLE 5. *Reports, accounts, audits.*—(*a*) *Progress reports.* The Operator shall provide the Government with monthly reports of units of work performed under the contract, in quintuplicate (five copies), upon forms provided by the Government. These progress reports shall be certified by the Operator, and shall constitute both the Operator's invoice of units of work performed on the project during the period covered by the report and his voucher for repayment by the Government, unless the Government requires the use of a standard voucher form with invoice attached. Progress reports shall include surface and/or underground engineering-geological maps or sketches showing the progress of the exploration, with assay-reports on samples taken concurrently with the advance in mineralized ground.

[1] If sufficient space is not provided in any blank, use an extra sheet of paper and refer to it in the blank.
[2] State name, address, and nature of organization if any.
[3] Give legal description or enough to identify the property, particularly excluding any land or interest therein to which the Government's lien is not to attach or the production from which is not to be subject to the Government's percentage royalty.
[4] Strike out the provision not applicable.
[5] Name of mineral or minerals.

(*b*) *Final report.*—Upon completion of the exploration work or termination of the contract the Operator shall provide the Government with an adequate geological and engineering report, in quintuplicate (five copies), including an estimate of ore reserves resulting from the exploration work.

(*c*) *Compliance with requirements.*—If, in the opinion of the Government, any of the Operator's reports are insufficient or incomplete, the Government may procure the making or completion of such reports and attachments as an expense of the exploration work; and the Government may withhold approval and payment of any vouchers depending upon insufficient or incomplete reports.

(*d*) *Accounts and audits.*—The Operator shall keep suitable records and accounts of the units of work performed, which the Government may inspect and audit at any time. The Government may at any time require a check of the work performed and an audit of the Operator's records and accounts, by a certified public accountant or otherwise, the cost thereof to be treated as a cost of the project. The Operator shall keep and preserve said records and accounts for at least 3 years after the completion of the project or the termination of this contract. Upon the completion of the project or termination of the contract the Operator shall render a final account and statement of work performed to accompany his final report.

ARTICLE 6. *Repayment by Operator.*—(*a*) If, at any time, the Government considers that a discovery or a development from which production may be made has resulted from the exploration work, the Government, at any time not later than 6 months after the Operator has rendered the required final report and final account, may so certify in writing to the Operator. The certification shall describe broadly or indicate the nature of the discovery or development. In the event of such certification, any minerals mined or produced from the land described in Article 2 within 10 years from the date of this contract, including any mined or produced before the certification, shall be subject to a percentage royalty which the Operator or his successor in interest shall pay to the Government, upon the net smelter returns, the net concentrator returns, or other net amounts realized from the sale or other disposition of any such production, in whatever form disposed of, including ore, concentrates, or metal, until the total amount contributed by the Government, without interest, is fully repaid, or said 10 years have elapsed, whichever occurs first, as follows:

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

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

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

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

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

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

ARTICLE 7. *Assignment, transfer, or loss of Operator's interest.*—Without the written consent of the Government, the Operator shall not assign or otherwise transfer or hypothecate this contract or any rights thereunder. The Operator shall not make any voluntary nor permit any involuntary transfer or conveyance of the Operator's rights in the land described in Article 2, without making suitable provision for the preservation of the Government's right to a percentage royalty on production and lien for the payment thereof; *Provided,* that mere failure by the Operator to maintain the Operator's rights in the land, without any consideration running to the Operator other than relief from the cost of maintaining such rights (as by surrender of a leasehold, failure to perform assessment work, or failure to exercise an option), coupled with complete abandonment by the Operator of all interest in or operations on the land for a period of 10 years from the date of this contract, shall not constitute such a transfer or conveyance. Should the Operator make or permit any transfer or conveyance in violation of this provision, the Operator shall be and remain liable for payment to the Government of the same amounts, at the same times, as would have been paid under the terms of the percentage royalty on production. If for any reason the net smelter returns, net concentrator returns, or other net amounts realized from the sale or other disposition of such production are not available as a means of measuring the amount of the Operator's liability, the amount thereof shall be estimated as well as may be, and in the event of dispute as to such estimates, the determination thereof by the Administrator of Defense Minerals Exploration Administration or by his successor shall be final and binding upon the Operator.

ARTICLE 8. *Termination and completion.*—The Government may, at any time, by written notice to the Operator, terminate this contract: (*a*) If the Operator fails to provide his share of the money necessary to prosecute operations pursuant to the terms of the contract; (*b*) if the Operator, in the opinion of the Government, fails to prosecute operations pursuant to the terms of the contract; or (*c*) if, in the opinion of the Government, operations up to the time of the notice have not indicated the probability of making any worth while discovery and in the opinion of the Government further operations are not justified.

ARTICLE 9. *Changes and added provisions* A certified drill log must accompany each Monthly Progress Report. Reimbursement will be authorized only for diamond drill holes completed to the satisfaction of the DMEA representative.

Executed in sextuplicate the day and year first above written.

THE UNITED STATES OF AMERICA

Ketzer Mines Inc
(Operator)

By Eleanor Ketzer
President

By W. H. Kang
Executive Officer, DMEA
Field Team, Region IV

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

Dudley D. McCandless [CORPORATE SEAL]

U. S. GOVERNMENT PRINTING OFFICE 16—66329-1

DEPARTMENT
Defence Mine
SEP 4 - 1953

ANNEX NO. 1

The following patented claims are:

Claim	U. S. Survey No.
Hidden Fortune	19,171
Lily	19,171
Pinto	19,171
Laura	19,171
Eliza	19,171
Ash Pan	18,340
Cypress	18,340
Slide	18,340
Gale	18,340

Claim	U. S. Survey No.
Red Spruce	18,340
Red Pine	18,340
Occidental	18,340
Gulch	18,340
Clyde	18,340
Lone Jack	18,340
Blue Chip	18,340
McKenna	18,340
Luck Bill	19,952

DEPARTMENT OF
Defense Mineral
RECEIVED
SEP 4 - 1959

EXHIBIT "A"

Description of the Work

The work consists of diamond drilling ten holes totaling approximately 3800 feet. All holes are to be started BX and to be finished not smaller than AX. The tentative location, direction, inclination, and depth of all the diamond drill holes are shown on Figure 2 which is attached and made a part of this exhibit.

Diamond Drill Station No. 1 is to be located at the shaft station on the sixth level of the Clyde shaft. Hole 1-2 is dependent on the results of hole 1-1. If in the opinion of the DMEA representative the results of hole 1-1 warrant the drilling of hole 1-2, hole 1-2 will be authorized.

Diamond Drill Station No. 2 is to be located in the Clyde tunnel approximately 50 feet from the east face of the southmost drift. Hole 2-3 is dependent on the results of holes 2-1 and 2-2. If in the opinion of the DMEA representative the results of holes 2-1 and 2-2 warrant the drilling of hole 2-3, hole 2-3 will be authorized.

Diamond Drill Station No. 3 is to be located 50 feet west of the Gale shaft on the 110-foot level of the Gale mine. Hole 3-2 is dependent upon the results of hole 3-1. If in the opinion of the DMEA representative the results of hole 3-1 warrant the drilling of hole 3-2, hole 3-2 will be authorized.

Diamond Drill Station No. 4 is to be located at the shaft station on the 110-foot level of the Gale mine. Holes 4-2 and 4-3 may be extended to a maximum length of 300 feet with the consent of the DMEA representative.

Some slabbing and timbering may be necessary to make room for 10-foot core pulls in any or all of the diamond drill stations.

All drill cores are to be suitably stored in acceptable core boxes. Cores are to be split and one-half retained for the use of the DMEA.

The unit costs below include station preparation, supervision, power, core boxes and any and all other costs incurred in the completion of the work.

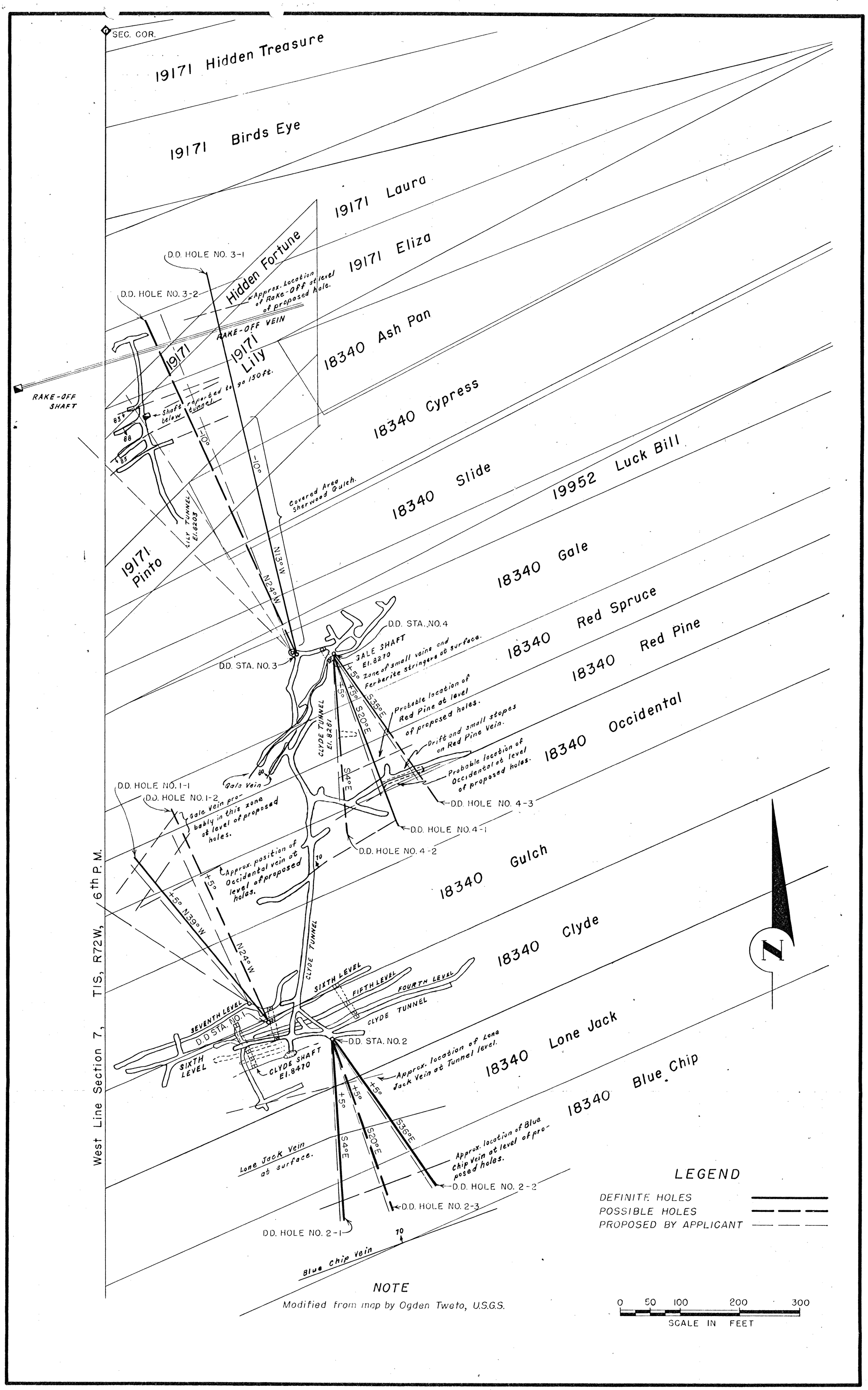
Estimated Costs of the Project

3800 feet of BX and AX diamond drilling @ $8.00 per foot, including station preparation, supervision, power, core boxes and any and all other costs incurred in the completion of the work

Total Cost of Project	$30,400.00
Government Participation 75%	$22,800.00

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

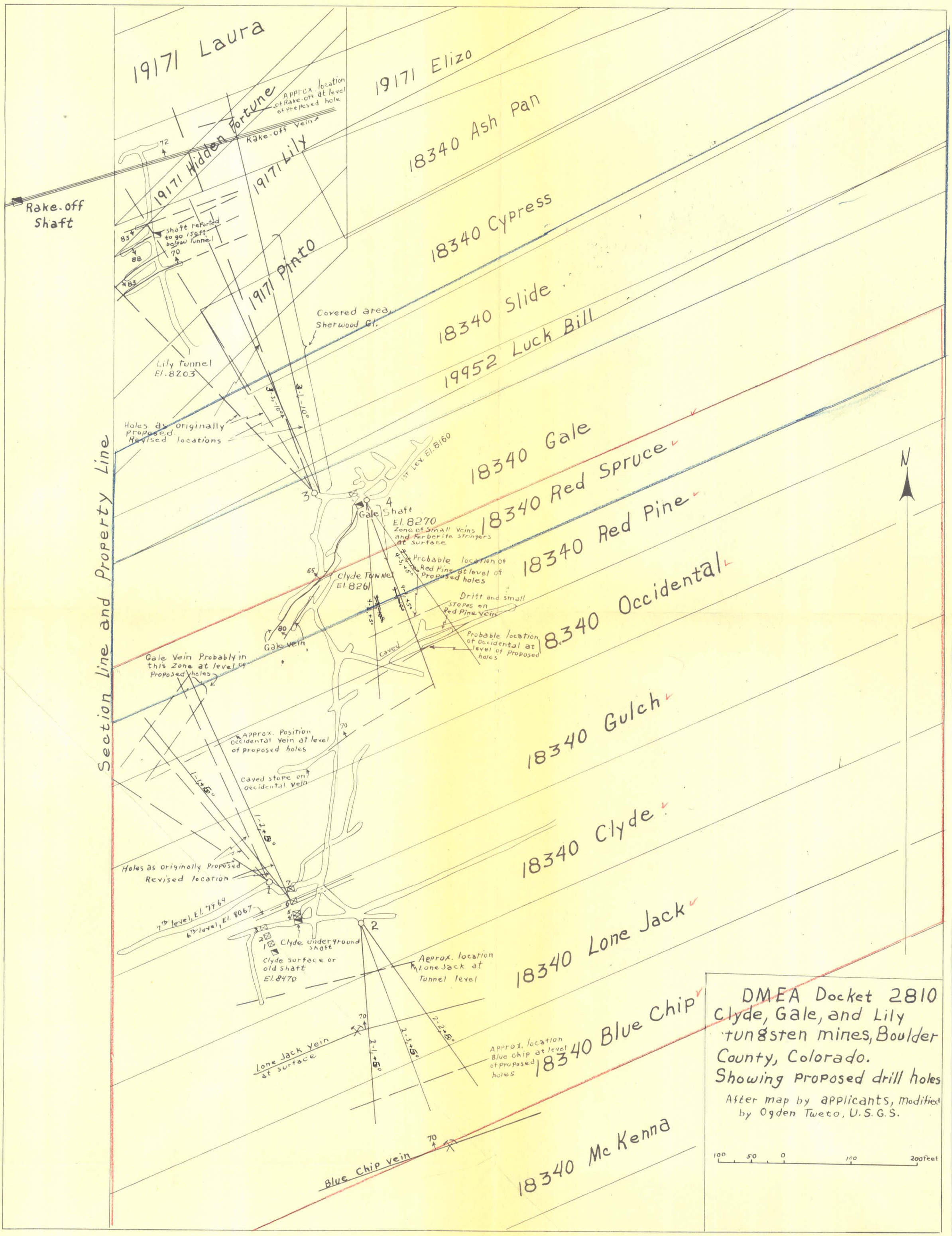
OFFICIAL BUSINESS



NOTE

Modified from map by Ogden Tweto, U.S.G.S.

FIGURE 2 - PLAN AND CLAIM MAP, CLYDE-GALE-LILY TUNGSTEN MINES, BOULDER COUNTY, COLO. DMEA 2810



DMEA Docket 2810
Clyde, Gale, and Lily tungsten mines, Boulder County, Colorado.
Showing proposed drill holes
After map by applicants, modified by Ogden Tweto, U.S.G.S.