2/2/55 gla

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JAN 27 1955

224 New Customhouse
Denver 2, Colorado

January 13, 1955

Memorandum

To: Administrator, Defense Minerals Exploration Administration
Attention: 200

From: DMEA Field Team, Region IV

Subject: Report of Examination, DMEA Docket 3383 (Uranium), N. B. Knight, Horseshoe claims, San Juan County, Utah

Enclosed are four copies of the report of examination, a copy of the letter of denial to the applicant, and two copies of Form 3b.

W H King
W. H. King

E N Harshman
E. N. Harshman

Enclosures - 6

HMC:ld

Copy to: E.N. Harshman
W. M. Traver
W. P. Williams
Mining Division
AEC
Sub
Chron

Entered by
DMEA Docket Section
1-31-55

COPY

January 13, 1955

224 New Customhouse
Denver 2, Colorado

Mr. N. B. Knight, Sr.
Box 154
Moab, Utah

Re: Docket No. DMEA 3383

Dear Mr. Knight:

Reference is made to your application for Government aid on the Horseshoe No. 2 and No. 4 claims.

The proposed exploration of these claims would definitely benefit your Horseshoe claims No. 1, No. 3, and No. 5, which surround your proposed exploration area on three sides, but you are unable to subordinate to the Government at this time.

The drilling now in progress on the Horseshoe No. 1, No. 3, and No. 5, will be of direct benefit to the Horseshoe No. 2 and No. 4 claims, and may reveal definite exploration target areas.

Under these circumstances, we regret to advise that your application is denied without prejudice. A new application which would include all five Horseshoe claims would receive proper consideration provided you would furnish a map showing the location and logs of all holes drilled, and can show valid title under Public Law 585.

The five copies of Amended Notice of Location received by this office December 16, 1954, are returned herewith.

Yours very truly,

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

/s/ E. N. HARSHMAN
E. N. Harshman

Enclosures
HMC:ld
Copy to: Administrator
Harshman
Williams
Traver
Sub
Chron

Reviewed by
DMEA OPERATING COMMITTEE
1-31-55
(Date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JAN 27 1955

Mining Division
Region IV

December 7, 1954

224 New Customhouse
Denver 2, Colorado

Memorandum

To: DMEA Field Team, Region IV

From: Chief, Mining Division, Region IV

Subject: Report of Examination, DMEA Docket 3383 (Uranium), N.B. Knight, Sr., Horse Shoe claims, San Juan County, Utah

Enclosed are eleven copies of the engineering report of examination on the subject docket.

The applicant requested $30,200.00 to drive a 900-foot adit and perform 900 feet of rim stripping.

The engineer examiner recommends a three stage drilling program estimated to cost a total of $22,632.00.

We concur in this recommendation provided the applicant shows valid title to the Horse Shoe claims.

W. H. King

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE
1-31-55
(Date)

Region IV

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JAN 27 1955

Building 20, Room 137
Denver Federal Center
Denver 2, Colorado
October 21, 1954

Memorandum

To: Executive Officer, DMEA Field Team, Region IV

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

Subject: DMEA 3383 (Uranium) N. B. Knight, Sr. (Horseshoe Nos. 2 and 4 claims), San Juan County, Utah

Enclosed are the original and ten copies of a "Summary, Conclusions, and Recommendations" by Randall Chew III, Geological Survey, and Glen Walker, Bureau of Mines, and Walker's engineering report on the subject docket.

Walker concludes, after making a field examination, at which time the examining team conferred with the applicant, that the area covered by the Horseshoe Nos. 2 and 4 claims is favorable for the discovery of uranium ore reserves. It has had favorable consideration by the Atomic Energy Commission for drilling at some future time, and consequently, there is no question about them favoring a DMEA project. Engineering estimates based on the Geological Survey's recommended exploration proposal calls for a project set up in three stages as outlined in the engineering report at a total over-all cost of $22,632.00; Government participation, 75 percent or $16,974.00. A unit-cost, short-form contract is suggested with the second and third stages requiring prior written Region IV Field Team approval.

I concur with Walker's conclusions and recommendations.

Before a contract is prepared, all five Horseshoe claims should be subordinated in accordance with the applicant's letter of September 16, 1954.

The copy of the Geological Survey report furnished by their Denver Federal Center office and the brochure have been previously returned to you.

W. M. Traver

W. M. Traver

WMT/kp
enclosure
cc/10
DMEA 3383
Chron

Approved by
DMEA OPERATING COMMITTEE
1-31-55
(date)

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Defense Minerals Exploration Administration
Denver Federal Center
Denver 2, Colorado

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JAN 27 1955

August 15, 1954

Memorandum

To: DMEA Field Team, Region IV

From: A. H. Koschmann

Subject: DMEA Docket 3383, N. B. Knight, Sr., Horseshoe claims Nos. 1 to 6, San Juan County, Utah

Enclosed are 10 copies of the geologic report by R. T. Chew, III, of the U. S. Geological Survey covering the above docket.

The applicant originally requested 900 feet of rim stripping on the Horseshoe Nos. 2 and 4 claims and 900 feet of drifting on the Horseshoe No. 2 claim. Mr. Chew believes that exploration is warranted and recommends a modified program of 8,500 feet of diamond drilling in three stages on the claims - stages 2 and 3 to depend upon the results of prior drilling.

The report was returned to the Grand Junction district office for minor revision thus the cost figure in Mr. Williams' original letter of transmittal is not correct. The cost figures for the revised program will be furnished in the engineering report.

Enclosed are 9 extra copies of the maps accompanying Mr. Chew's report.

E. M. Hausknecht
for A. H. Koschmann
Supervising Geologist
Colorado-Wyoming

Enclosures (19)

Reviewed by
DMEA OPERATING COMMITTEE
1-31-55
(date)

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
P. O. Box 360
GRAND JUNCTION, COLO.

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JAN 27 1955

July 30, 1954

Mining Division
Date Rec'd
AUG 25 1954
BUREAU OF MINES
Denver, Colorado

Memorandum

To: A. H. Koschmann, Field Team, Region IV

From: W. P. Williams

Subject: DMEA 3383, N. B. Knight, Sr., Horseshoe claims Nos. 1 to 6, San Juan County, Utah

Transmitted herewith are eleven copies of a geologic report by R. T. Chew, III, covering the subject DMEA application.

Chew recommends approval of a drilling program. His recommended plan is modified from the applicant's original proposal consisting of 900 feet of drift and 900 feet of rim stripping at an estimated cost of $30,202. Chew's alternate project is estimated to cost about $24,167.

We are also sending herewith nine extra copies of the maps accompanying Chew's report.

W P Williams

W. P. Williams
Geologist

WPW/mlr

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE
1-31-55
(date)

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JAN 27 1955

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMEA 3383, Horseshoe Nos. 2 and 4 claims

N. B. Knight, Sr.

San Juan County, Utah

Uranium

Randall Chew III, Geologist
Geological Survey

Glen Walker, Mining Engineer
Bureau of Mines

October 19, 1954

Reviewed by
DMEA OPERATING COMMITTEE
1-31-55
(date)

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JAN 27 1955

DMEA 3383

HORSESHOE NOS. 2 AND 4 CLAIMS
N. B. KNIGHT, SR.
SAN JUAN COUNTY, UTAH

Summary, Conclusions, and Recommendations

By Randall Chew III
Geologist
Geological Survey

Glen Walker
Mining Engineer
Bureau of Mines

Reviewed by
DMEA OPERATING COMMITTEE
1-31-55
(date)

DMEA 3383

HORSESHOE NOS. 2 AND 4 CLAIMS
N. B. KNIGHT, SR.
SAN JUAN COUNTY, UTAH

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

By Randall Chew III and Glen Walker

N. B. Knight, Sr., of Moab, Utah, made application for a loan under the Defense Production Act of 1950 to explore the Horseshoe Nos. 2 and 4 mining claims for uranium. These two claims and three other adjoining claims are located in sec. 7, T. 33 S., R. 21 E., Salt Lake meridian, San Juan County, Utah. The application was designed to perform the exploration by 900 feet of rim stripping, 900 feet of adit driving, and rehabilitation of a log cabin at an estimated cost of $30,200.00.

A field investigation of the property by a Defense Minerals Exploration Administration Region IV examining team was made on July 7, 1954. On September 16, 1954, N. B. Knight, Sr., wrote the Region IV Field Team in response to their letter of September 1, 1954, suggesting exploration by core drilling only, that he concurred with the proposal as the most logical method of exploration and in the same letter agreed to subordinate all five Horseshoe claims to the Government in the event a contract was entered into.

The Indian Creek mining district, especially the upper Cottonwood Canyon area where the claims are located, has been favorably considered by the Atomic Energy Commission for core drilling. The uranium-vanadium deposits are in the lower Chinle formation of the

Reviewed by
DMEA OPERATING COMMITTEE
1-31-55
(date)

Upper Triassic which in the vicinity of the Horseshoe claims is a sandstone from 75 to 100 feet thick underlain by an 8-foot basal conglomerate. The ore occurs near the bottom of this stratum and it has been traced along the rim for over 1,000 feet. However, it is not mineralized commercially for that distance, but does show scintillator counts in newly excavated adits on the Horseshoe No. 2 claim and older mine workings on the Horseshoe No. 1 claim. Geological interpretation is that a concealed drainage channel trending roughly east-west is indicated in the conglomerate representing the ore-bearing horizon with the overlying Chinle sandstone forming abrupt cliff above. Production has resulted from mining operations in the conglomerate on the No. 1 claim.

A program involving only surface core drilling is recommended by the examining team set up in three stages as a unit-cost, short-form contract. Stage I includes an access road to Horseshoe claims Nos. 2 and 4, drilling 30 AX diameter holes for an estimated 3,000 feet at $2.79 per foot or $8,370.00; Stage II, drilling 14 AX diameter holes for an estimated 1,400 feet at $2.69 per foot, or $3,766.00; and Stage III, drilling 41 AX diameter holes for an estimated 4,100 feet at $2.56 per foot or $10,496.00. The total over-all cost will be $22,632.00, Government participation $16,974.00. Stages II and III require prior written authorization by the Region IV Field Team.

UNITED STATES DEPARTMENT OF THE INTERIOR

DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION
REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMEA 3383, N. B. Knight, Sr., Horseshoe claims Nos. 1 to 6
San Juan County, Utah

Uranium

Geologic Report

by

R. T. Chew, III
U. S. Geological Survey

July 30, 1954

Reviewed by
DMEA OPERATING COMMITTEE
1-31-55
(date)

INTRODUCTION

N. B. Knight, Sr., Moab, Utah, applied (DMEA 3383) on May 18, 1954, for assistance to explore for uranium. The field team, consisting of Glenn Walker and Manuel Robles representing the Bureau of Mines, and Randall T. Chew, III, and Fred A. Mumpton, representing the Geological Survey, examined the property on July 7, 1954, accompanied by Mr. Knight. The examination took one complete day.

The property is in Secs. 7 and 18, T. 33 S., R. 21 E., Salt Lake Base and Meridian, San Juan County, Utah. It can be reached by a dirt road which leaves U. S. Highway 160 about 16 miles north of Monticello and runs west about 25 miles to Dugout Ranch, thence south about 8 miles to the property. The road is graded and passable to passenger cars and trucks at all times except immediately after heavy rains.

The applicant requested assistance to drift 900 feet and strip 900 feet of rim at a total cost of $30,202. Upon completion of the field examination, and in later correspondence between the members of the field team, an alternate project consisting of about 8,500 feet of core drilling in three stages was agreed upon. The alternate project is recommended for approval.

The applicant listed under Item 3 of the application for aid, ten claims which would be benefitted by the proposed exploration. All the claims except the Horseshoe Nos. 2 and 4 have been leased to the Four Stages Uranium Company, and, therefore, this recommendation concerns the Horseshoe Nos. 2 and 4 claims only. The applicant is half owner of these claims. C. A. Frost owns the other half interest and has leased it to the applicant.

The location of the Horseshoe claims is shown on figure 1. The Chinle rim on the Horseshoe No. 2 claim has been stripped and three short drifts have been driven approximately as shown on figure 2. A sketch map of the underground workings on the Horseshoe No. 1 is also shown on the same map. The underground workings on the adjacent Horseshoe No. 1 claim cover an area about 200 by 100 feet and that ore body is considered to have been worked out.

GEOLOGY AND ORE DEPOSITS

The ore bodies on both the Horseshoe No. 1 and No. 2 claims are in the basal sandstone of the Triassic Chinle formation. In the Cottonwood Wash area this sandstone averages about 30 feet thick, though at the Horseshoe claims it is 75-100 feet thick because of channeling into the underlying Moenkopi formation. This basal sandstone thins to the north toward Lockhart Canyon, but may thicken again to form the basal Chinle sandstone which is mineralized in that area, too.

At the Horseshoe claims, the lowest 30 feet of the sandstone is irregularly bedded and the lowest 6 to 8 feet is a conglomerate with some cross-bedding. The middle 50 feet is nearly massive sandstone and the upper 15 to 20 feet of the unit is again irregularly bedded.

The lowest conglomerate is the ore horizon. At the Horseshoe No. 2, it is 8-feet thick. The conglomerate is both limy and siliceous and contains abundant well-rounded brown and orange chert or jasper pebbles averaging half an inch in diameter, as well as many siltstone seams and galls up to 1 foot in diameter. The matrix contains clear coarse quartz grains and white altered feldspar grains. Pyrite masses as much as 8 inches in diameter, but averaging about 1/8 inch in diameter, occur near the base of the conglomerate associated with abundant limonite. Carbon occurs in this same horizon as seams up to 6 inches long and less than 1/8-inch thick and also as sand-grain-sized specks. The carbon is mostly black, vitreous, and coaly. Some larger wood fragments in the overlying sandstone are replaced by limonite.

Radioactivity sufficient to indicate the presence of ore-grade material occurs in the vitreous carbon and adjacent to, but not in, the pyrite blebs. The ore is spotty on the Horseshoe No. 2, but is localized near the bottom of the conglomerate. In the ore body on the Horseshoe No. 1, it was more continuous. Yellow and yellow-green secondary uranium minerals have formed on the walls in the damp parts of the mine workings, but no other uranium minerals were noted during the field investigation. Carlson and Dix (1953) report pitchblende visible in polished sections and associated with sulfides that replace fossil logs in the Horseshoe No. 1. They also report the presence of fossil logs 2 feet thick and 12 feet long in all three sandstone units.

The ore body on the Horseshoe No. 1 claim has probably been mined out and there has been no extensive exploration for other ore bodies. The Horseshoe No. 1 produced 869.48 tons of ore averaging .23 percent U_3O_8 in the period from July 1951 to March 1954, according to AEC Finance Division figures. There has been no production for major exploration on the other claims in the area. No reserve estimates have been computed because of the lack of specific information.

The Cottonwood Wash-Hop Canyon area, of which the Horseshoe claims are a part, has not been extensively explored. Five diamond-drill holes are being drilled on the same channel about half a mile east of the Horseshoe claims. The mine on the Horseshoe No. 1 is the only extensive mining operation in the area. The nearest producing area is on Elk Ridge about 15 miles to the southwest.

Carlson and Dix have recommended that the Atomic Energy Commission do 15,000 feet of core drilling in the Cottonwood Wash area, beginning on the Horseshoe No. 1 and, if favorable results are obtained, continuing eastward along the channel. In a conversation between the writer and H. B. Wood of the AEC, it was decided that work under a DMEA contract would be preferred to work by the AEC because of the greater likelihood of the Government receiving a return on its investment.

RECOMMENDATIONS

The project approved here includes only the Horseshoe Nos. 2 and 4 claims, the remainder have been leased to others. The applicant owns a half interest in the subject claim and has leased the other half interest from C. A. Frost.

The applicant's original proposal was for approximately 900 feet of rim stripping on the Horseshoe Nos. 2 and 4 claims and for approximately 900 feet of drifting on the Horseshoe No. 2. The stripping would allow inspection of the contact between the Chinle and Moenkopi formations most of which is now covered. The drifting would test the ore zone which is exposed in the drift and cut already made.

After examination of the property, the examining team decided that an equivalent amount of money could be used better in core drilling which would more thoroughly test the ground behind the rim than would the applicant's proposed drifting and stripping. A three-stage program has been devised. Stage I would test the ground which is considered most likely to contain a minable ore deposit. Stage II tests the ground along the paleostream channel and would be drilled if the Stage I drilling proved successful. Stage III tests the flanks of the paleostream channel and would only be done if minable ore is found in Stage I and/or Stage II.

All three stages would consist of core drilling, the drill holes to be 100 feet apart, forming north-south trending fences 150 feet apart. The holes in adjacent fences are to be staggered 50 feet so that a given hole is half way between two holes in the neighboring fence. The suggested locations for the holes are shown on Figure 2.

Stage 1.-- 30 holes are to be drilled immediately behind the workings on the Horseshoe No. 2 claim in five fences, as specified earlier and as shown on Figure 2. The first hole in each fence should be 50 to 100 feet behind the rim, but the offsetting of each fence must be rigidly adhered to.

The Stage I drilling will test the area where it is thought a minable ore deposit is most likely to be found. The area is behind the mineralization at the rim on the Horseshoe No. 2 claim and lies in a direction parallel to the stream flow from the Horseshoe No. 1 ore body.

Stage II.--14 holes are to be drilled immediately west of the area drilled in Stage I. This area is considered to be favorable for ore deposition also, especially if ore is found in the Stage 1 drilling. The area to be tested lies in a direction parallel to the stream flow from both the Horseshoe No. 1 and No. 2 ore bodies, but is farther removed from the Horseshoe No. 1 ore - the only ore body that has so far been proven in this channel.

Stage II should be authorized if any holes in Stage I are favorable, even though no minable ore body is found in Stage I. Favorable holes in Stage I will indicate a continuation of lithologic conditions favorable for ore deposition even though no ore may be found, and there is a good chance that ore may be found in Stage II even though none is found in Stage I. If Stage I shows no favorable holes, Stage II would not be necessary for favorable lithologic conditions would then be shown not to continue parallel to the direction of stream flow and there would be little likelihood of finding a minable ore body farther west.

Stage III.-- 41 holes would be drilled north of the areas covered in Stages I and II and would complete drilling of the two claims. The holes would be continuations of the fences in Stages I and II.

Stage III should be authorized only if minable ore is found in either Stages I or II. Stage III will test the ground farther up on the flanks of the channel but not in a direction parallel to the stream flow from any of the ore bodies that might be found by the earlier drilling. Experience on the Colorado Plateau has shown that ore deposits tend to occur on the flanks of the channels rather than in the center. The center of this channel, according to Carlson and Dix (1953) is immediately south of the rim on the Horseshoe Nos. 2 and 4. Therefore, any ore found on these two claims as a result of Stage I and Stage II will be relatively close to the center of the channel and it seems possible that more might be found farther up on the flanks.

Field examination, geologic study of the property, and a knowledge of the size and distribution of ore bodies in the vicinity of the horseshoe claims indicate that the hole spacing as shown on figure 2 is optimum for the discover of new ore.

Each drill hole should be sampled once at the ore horizon and the samples assayed for uranium and copper. Any ore or mineralized holes should be offset on 50-foot centers borrowing footage from the succeeding stages.

There appears to be a reasonable possibility that there is undiscovered ore in the paleostream channel. Although the ore showing at the surface on the Horseshoe No. 2 is thin, it is similar to the occurrence on the Horseshoe No. 1. The presence of sulfides and the abundant limonite, which could logically have had sulfides as a source, strengthens the possibility of a minable ore body. Sulfides are a fairly reliable guide to ore in Triassic uranium deposits and are associated with ore bodies which are often of higher than usual grade.

About 1-1/4 miles of access road are necessary before drilling can begin. This will be provided by the applicant as part of his share of Stage I. Water for drilling is available in the canyon below the mine, necessitating a haul of about 1-1/4 miles.

Work on the contract could probably begin within a few weeks after the date of the DMEA contract, and completion of the three stages would take about five months.

It is recommended that the project as outlined be approved and a DMEA contract prepared.

Carlson, W. A., and Dix, G. P. Recommendation for drilling Hop Canyon area, San Juan County, Utah, U. S. Atomic Energy Commission RME-34 (confidential), 1953.

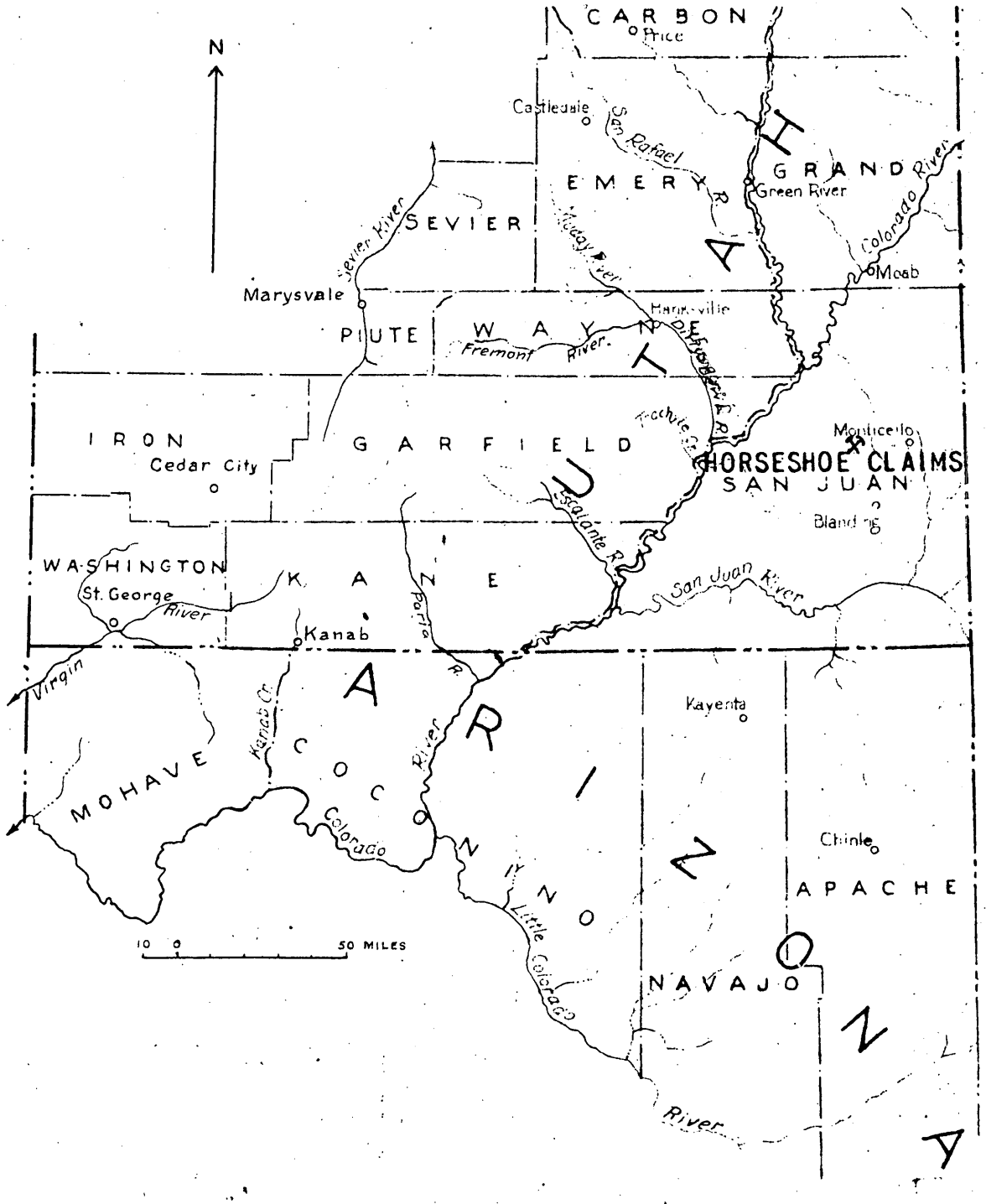

Figure 1. MAP OF PART OF THE COLORADO PLATEAU SHOWING LOCATION OF THE HORSESHOE CLAIMS

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JAN 27 1955

DMEA 3383

HORSESHOE NOS. 2 AND 4 CLAIMS
N. B. KNIGHT, SR.
SAN JUAN COUNTY, UTAH

Engineering Report

By Glen Walker
Mining Engineer
Bureau of Mines

October 19, 1954

Reviewed by
DMEA OPERATING COMMITTEE
1-31-55
(date)

DMEA 3383

HORSESHOE NOS. 2 AND 4 CLAIMS
N. B. KNIGHT, SR.
SAN JUAN COUNTY, UTAH

CONTENTS

Engineering Report — Page

Introduction..... 1
Acknowledgments..... 1
Location, topography, and physical features..... 2
History and production..... 3
Ownership and extent..... 4
Description of the deposit..... 4
Present status..... 5
    Exploration and development..... 5
    Mining and milling equipment and other facilities..... 5
Project proposals with costs..... 6
    Summary of costs..... 10
Conclusions..... 10
Recommendations..... 10

ILLUSTRATIONS

Figure		Follows page
1.	Location map, Horseshoe Claims Nos. 2 and 4, N. B. Knight, Sr., San Juan County, Utah.....	2
2.	Sketch map of Horseshoe claims showing mine workings and location of drill holes recommended for drilling with DMEA aid.....	*
3.	Map showing workings on Horseshoe claim No. 2, N. B. Knight, Sr., San Juan County, Utah.....	5

*See figure with geologic report.

Reviewed by
DMEA OPERATING COMMITTEE
1-31-55
(date)

DMEA 3383

HORSESHOE NOS. 2 AND 4 CLAIMS
N. B. KNIGHT, SR.
SAN JUAN COUNTY, UTAH

ENGINEERING REPORT

By Glen Walker

INTRODUCTION

N. B. Knight, Sr., of Moab, Utah, has made application for Defense Minerals Exploration Administration assistance in exploring for uranium ores on two mining claims, Horseshoe Nos. 2 and 4 in sec. 7, T. 33 S., R. 21 E., Salt Lake meridian, along Cottonwood Canyon in the Indian Creek district of San Juan County, Utah. The proposed project under DMEA 3383, stipulated 900 feet of rim stripping, 900 feet of adit, and rehabilitation of a log cabin at an estimated cost of $30,200.00.

An examination of the property was made in the field on July 7, 1954, by Region IV representatives of the Geological Survey and Bureau of Mines.

ACKNOWLEDGMENTS

The examining team, consisting of Randall Chew III and Fred A. Mumpton of the Geological Survey, Manual Robles and the writer of the Bureau of Mines, was accompanied by the applicant, N. B. Knight, Sr., who concurred with the exploration proposed in this report. He furnished helpful information regarding the property and acted as guide to the team.

Reviewed by
DMEA OPERATING COMMITTEE
1-31-55
(date)

LOCATION, TOPOGRAPHY, AND PHYSICAL FEATURES

The unpatented Horseshoe claims, Nos. 1, 2, 3, 4, and 5 are in secs. 7 and 18, T. 33 S., R. 21 E., Salt Lake meridian (fig. 1), on the north side of an unnamed box canyon about 1/2 mile long, which is tributary to Cottonwood Canyon on the west. The general area is designated as the Indian Creek district of San Juan County, Utah.

In this vicinity the topography is typical of the Colorado Plateau region, in which mesas have been dissected by stream and wind action, forming abrupt bluffs of the more resistant strata. Differences in altitude at the property vary from 200 to 500 feet. Access to mesa tops and to some uranium-bearing horizons is a major problem in exploration of the area.

The region is semiarid with most of the annual 12 inches of precipitation falling as snow and midsummer rains, frequently of cloudburst proportions. Generally, weather conditions permit year round mining activity, except for occasional snow storms and short periods during the spring thaws. Adequate water for drilling and mining use can be obtained from a perennial spring at the confluence of the box canyon and Cottonwood. The haul to the mine adit would be about 1/2 mile, and to a drill rig situated on the mesa, about 1-1/2 miles.

Juniper and pinon, some of which is suitable for small mine timber, grow in abundance on the property. Ponderosa pine of stull and post size is readily available in the Abajo Mountains, a few miles south. In these mountains there are also several small sawmills from which dimension lumber can be obtained at comparatively reasonable cost.

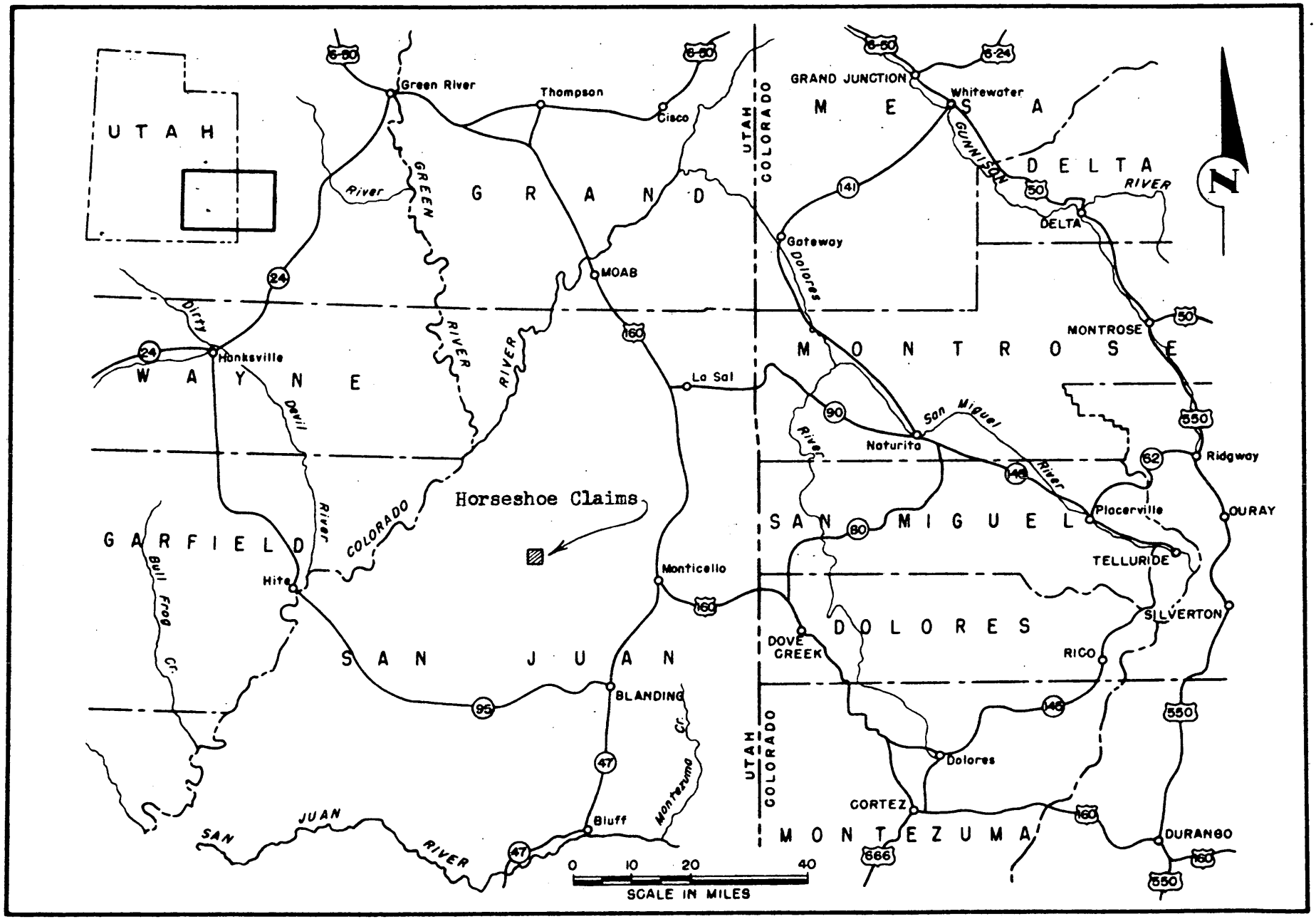

FIGURE 1 - LOCATION MAP, HORSESHOE CLAIMS NO'S 2 & 4, N.B. KNIGHT SR., SAN JUAN COUNTY, UTAH (DMEA 3383)

A good, dry-weather, secondary road, 33 miles in length, connects the property with U. S. Highway 160 at a point 16 miles north of Monticello. The nearest railhead, Crescent Junction, is approximately 140 miles northeast. The majority of the manpower and mining supplies can be procured in either Moab or Monticello, but the diamond drilling repairs and supplies would very probably have to be shipped from Grand Junction, Colo., or Salt Lake City, Utah. Although there are no living facilities on the property, an old log cabin about 3/4 mile away in Cottonwood Canyon has been rehabilitated by the applicant, and will accommodate an adequate number of men to complete the proposed work.

HISTORY AND PRODUCTION

Only one load, about 10 tons, of ore is reported to have been produced from the Horseshoe Nos. 2 and 4 claims. It is said to have contained 0.10 percent U_3O_8 and 0.04 percent V_2O_5. An adjoining claim, the Horseshoe No. 1, is reported to have produced 900 tons of uranium ore valued at $30,000.00. This production was made by the applicant and came from the horizon to be prospected. The Atomic Energy Commission credits a production of 869.4 tons with an average content of 0.20 percent U_3O_8 and 0.02 percent V_2O_5 to this claim. These figures indicate a gross value for the ore of slightly over $31,000.00. About a mile air line east of this property there was a core drilling project in progress at the time of the examination, but no information concerning the results was available.

OWNERSHIP AND EXTENT

From the field examination of the location notices and affidavits of assessment work performed and correspondence with the applicant, it appears there is sufficient evidence that he has rights to the land involved. Should the proposed exploration be deemed worthy of a contract, it is suggested that signature of the appropriate party be obtained on forms MF-203 "Owner's Consent to Lien" covering all five Horseshoe claims, although the exploration is to be performed on only the Nos. 2 and 4 claims.

DESCRIPTION OF THE DEPOSIT

The uranium-vanadium deposits discovered to date in the upper Cottonwood Canyon area are in the lower Chinle formation of the Triassic. This formation on the applicant's ground is a sandstone 75 feet to 100 feet thick with an 8-foot basal conglomerate. The ore minerals occur near the bottom of this stratum. The mineralized conglomerate was traced along the rim for over 1,000 feet to the Horseshoe No. 1 mine by the Geological Survey member of the examining team. It should not be interpreted that this formation is commercially mineralized for this distance, but scintillator counts in the newly excavated adits and the older workings of the Horseshoe No. 1 claim indicated the conglomerate to be the ore-bearing horizon. According to geological interpretation, an old buried drainage channel trending roughly east-west is overlain by the sandstone forming the abrupt cliff.

Where the ore-bearing conglomerate could be examined in accessible openings and outcrops, it contained rounded pebbles of quartz and sandstone, varying in size up to 2 inches with some interstitial

lime. Carbonaceous matter in pieces up to 6 inches in diameter and 2 feet long were noted in this rock. The contained ore minerals are the usual yellow and green varieties of uranium and vanadium; uraninite has been reported from the Horseshoe No. 1 claim by the Atomic Energy Commission. The conglomerate is immediately underlain by gray mudstone of undetermined thickness.

PRESENT STATUS

Exploration and Development

On Horseshoe No. 4 claim only some superficial cuts have been made along the outcrop of the ore-bearing horizon. Figure 3 shows the location and extent of the present workings on Horseshoe No. 2 claim. The eastern-most adit on the Horseshoe No. 2 claim was the original attempt to explore the deposit, but it has caved to an extent which obviates testing the ore grade. The middle adit was driven next in chronological order. As may be assumed from its branching appearance, the rock here seems to be more mineralized in the west face. Although the western adit has penetrated the formation only 8 to 10 feet, the indications of mineral are comparable to the middle workings.

Mining and Milling Equipment and Other Facilities

The following equipment was on hand at the time of the examination:

1 Gardner-Denver 210-c.f.m. portable air compressor
1 1/2-ton (estimated) rubber-tired, 3-wheel muck cart for mule haulage
1 D4 Caterpillar tractor with angle dozer
1 jackleg with 50-lb. jackhammer
20 gal. pressure water tank
1 800-watt gasoline driven DC generator for lights
Air and water hoses (50 feet of each)
Several pieces of jackhammer drill steel and detachable bits
1 burro.

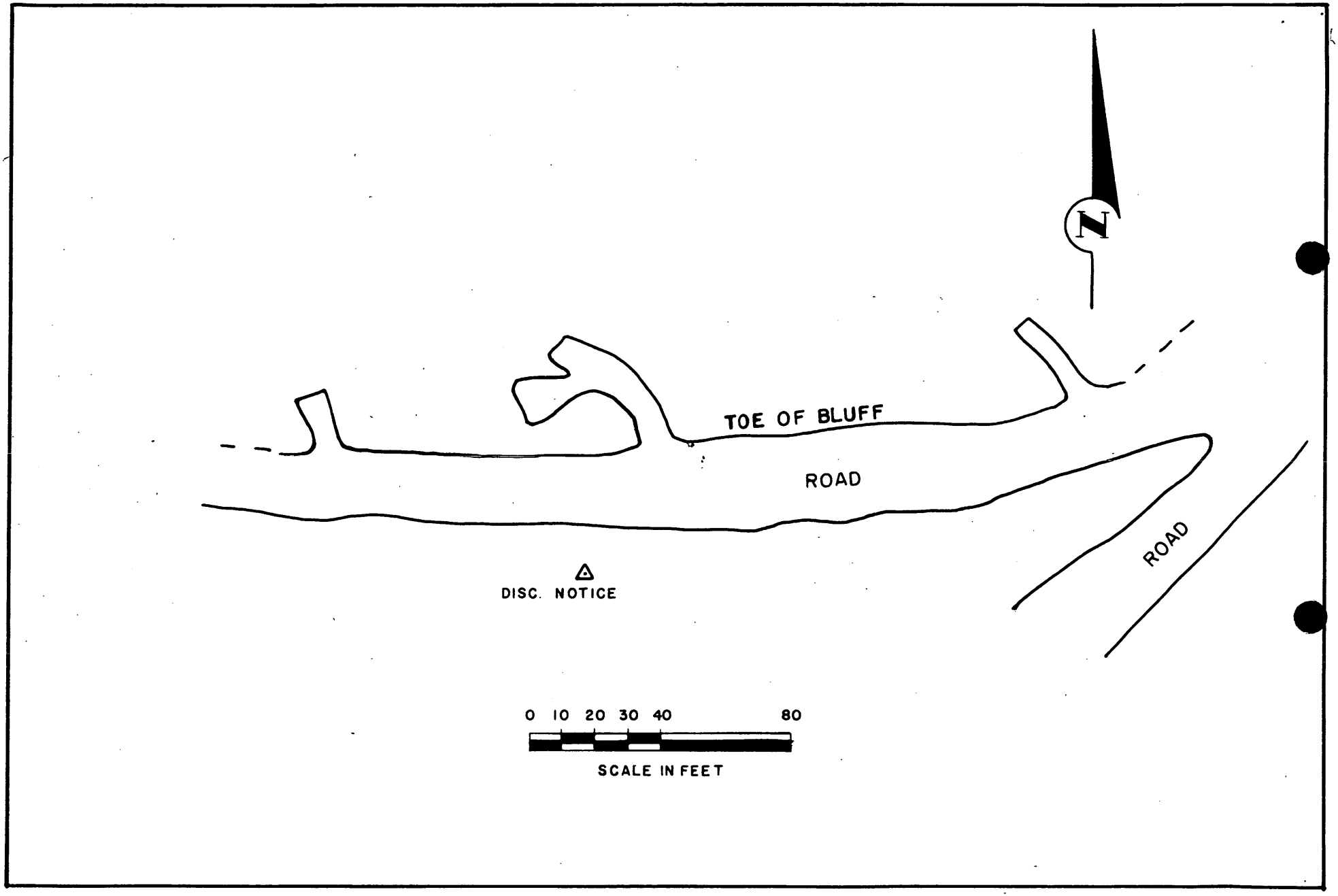

FIGURE 3 – MAP SHOWING WORKINGS ON HORSESHOE CLAIM NO.2, N.B. KNIGHT SR., SAN JUAN COUNTY, UTAH (DMEA 3383)

The applicant stated that any or all this equipment will be used for the benefit of the proposed work.

An old log cabin about 3/4 mile away in Cottonwood Canyon has been rehabilitated by the applicant. There is no mill available nearer than Monticello, Utah, about 50 miles distance where any ore produced would be shipped for treatment.

PROJECT PROPOSALS WITH COSTS

The project proposed by the applicant included:

900 feet of rim stripping at $3.00 per foot (by bulldozer)	$ 2,700.00
900 feet of tunnel at $30.00 per foot	27,000.00
Rehabilitation of cabin	500.00
Total cost	$30,200.00

After the examination was completed, it appeared that the property could be more adequately explored by a pattern of core drill holes and the applicant agreed by letter to the Region IV Field Team, dated September 16, 1954. The suggested operation would be conducted in three stages with access road construction as part of the first. Coring is thought to be the most practical method for sampling the ore horizon because of its excessive moisture content.

Stage I includes approximately 1-1/2 miles of access road to be built by the applicant with his bulldozer. Also in Stage I, 30 AX diamond core holes would be drilled from the top of the bluff to the ore horizon, an estimated depth of 100 feet. These holes would be 100 feet apart in staggered rows 150 feet apart beginning as close to the rim as practical and continuing in a northerly direction parallel to the side lines of and only on the Horseshoe Nos. 2 and 4 claims,

as shown on figure 2 of the geological report. Chemical analyses of the split core from the ore horizon would be made on each hole; the remainder of the core should be retained for geological examination by the Government.

Stage II consists of 14 AX diameter core holes drilled on the same pattern as those in Stage I; but in the area immediately west of Stage I. Sampling and analysis are to be similar to Stage I also. This part of the project will be pursued in the event any hole of Stage I is favorable, lithologically.

Stage III, consisting of 41 AX diameter holes in the area north of the ground drilled in the first two stages, would be authorized only if mineable ore is discovered by the foregoing work. The sampling and analytical work is to be performed the same as that outlined under Stage I.

All highly mineralized holes would be offset at 50-foot intervals by additional ones, the footage consumed in this manner to be subtracted from succeeding stages. This provision could, of course, considerably reduce the number of holes recommended for Stage III. In that event, it is suggested that the location of Stage III holes be such as to further the information previously obtained and to also retain the original pattern. An increased hole depth over that estimated would also have the effect of reducing the number of holes.

No particular difficulty is anticipated in the drilling operation, as it will be necessary to core only an occasional hole from the collar to ascertain the depth to the ore horizon. The overburden is massive, homogenous sandstone which should retain circulating water rather well.

The accurate location of holes according to the suggested pattern and the examination of ore horizon core are to be the responsibility of a part-time geologist hired by the applicant. This service is necessary because the applicant has indicated his inability to interpret core sufficiently to ascertain the horizon to which the bit has penetrated in a particular hole. Stages II and III will require prior written authorization by the Region IV Field Team.

The following is an itemized cost estimate of the project as outlined:

Stage I

Construct 1-1/2 mile access road

Labor and supervision			
Applicant at $500.00 per month for 1/2 month	$ 250.00		
Geologist at $500.00 per month for 2 months	1,000.00		
Total labor and supervision		$1,250.00	
Operating materials and supplies			
Fuel oil and grease for 1/2 month for bulldozer	81.25		
Total operating supplies		81.25	
Operating equipment			
Rental: depreciation $3,000.00 D4 "Cat" at $50.00 per month for 1/2 month	25.00		
Total operating equipment		25.00	
Contract			
3,000 feet AX diameter core drilling in 30 holes at $2.25 per foot	6,750.00		
Total contracts		6,750.00	
Miscellaneous			
Bookkeeping (by applicant) at $50.00 per month for 2-1/2 months	125.00		
Compensation insurance, Social Security, unemployment tax, etc. at 5 percent of $1,250.00	62.50		
30 chemical analyses at $3.00	90.00		
Total miscellaneous		277.50	
Total Stage I			$8,383.75

Cost per foot $8,383.75/3,000 = $2.79

Stage II

Contract			
1,400 AX diameter core drilling in 14 holes at $2.25 per foot	$3,150.00		
Total contract		$3,150.00	
Labor and supervision			
Geologist at $500.00 per month, 1 month	500.00		
Total labor and supervision		500.00	
Operating materials and supplies			
None			
Operating equipment			
None			
Miscellaneous			
Bookkeeping (applicant) at $50.00 per month, 1 month	50.00		
14 chemical analyses at $3.00	42.00		
Compensation insurance, Social Security, unemployment tax, etc. 5 percent of $500.00	25.00		
Total miscellaneous		117.00	
Total Stage II			$3,767.00

Cost per foot $3,767.00/1,400 = $2.69

Stage III

Contract			
4,100 feet AX diameter core drilling in 41 holes at $2.25 per foot	9,225.00		
Total contract		9,225.00	
Labor and supervision			
Geologist at $500.00 per month for 2 months	1,000.00		
Total labor and supervision		1,000.00	
Operating materials and supplies			
None			
Operating equipment			
None			

Miscellaneous			
Bookkeeping (applicant) at $50.00 per month for 2 months	$ 100.00		
41 chemical analyses at $3.00	123.00		
Compensation insurance, Social Security, unemployment tax, etc. 5 percent of $1,000.00	50.00		
Total miscellaneous		$ 273.00	
Total Stage III			$10,498.00

Cost per foot $10,498.00/4,100 = $2.56

Summary of Costs

Contracts	$19,125.00
Labor, supervision, and technical services	2,750.00
Operating materials and supplies	81.25
Operating equipment	25.00
Miscellaneous	667.50
Total cost of project	$22,648.75

CONCLUSIONS

The proposed project on the Horseshoe property would tend to explore geologically favorable ground in the vicinity of a former productive uranium mine. This particular district has received favorable attention from the Atomic Energy Commission geologists, who have recommended drilling several thousand feet in the area, but pressure of other work has delayed this work.

RECOMMENDATIONS

It is recommended that Government assistance for exploration on the Horseshoe claims be granted the applicant and a short-form, unit-cost contract be prepared in three stages to include the following:

Stage I

1. Construct an access road approximately 1-1/2 miles from Cottonwood Canyon to the top of the mesa covered by Horseshoe Nos. 2 and 4 claims

2. Drill an estimated 3,000 feet of AX diameter surface core drill holes (30) at $2.79 per foot	$8,370.00
Stage II	
Drill an estimated 1,400 feet of AX diameter core holes (14) at $2.69 per foot	3,766.00
Stage III	
Drill an estimated 4,100 feet of AX diameter core holes (41) at $2.56 per foot	10,496.00
Total cost of project	$22,632.00

Over-all cost per foot $22,632.00/8,500 = $2.66

The Government participation in a uranium loan will be 75 percent of $22,632.00, or $16,974.00.

/fkp

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JAN 27 1955

224 New Customhouse
Denver 2, Colorado

January 13, 1955

Mr. N. B. Knight, Sr.
Box 154
Moab, Utah

Re: Docket No. DMEA 3383

Dear Mr. Knight:

Reference is made to your application for Government aid on the Horseshoe No. 2 and No. 4 claims.

The proposed exploration of these claims would definitely benefit your Horseshoe claims No. 1, No. 3, and No. 5, which surround your proposed exploration area on three sides, but you are unable to subordinate to the Government at this time.

The drilling now in progress on the Horseshoe No. 1, No. 3, and No. 5, will be of direct benefit to the Horseshoe No. 2 and No. 4 claims, and may reveal definite exploration target areas.

Under these circumstances, we regret to advise that your application is denied without prejudice. A new application which would include all five Horseshoe claims would receive proper consideration provided you would furnish a map showing the location and logs of all holes drilled, and can show valid title under Public Law 585.

The five copies of Amended Notice of Location received by this office December 16, 1954, are returned herewith.

Yours very truly,

W H King
W. H. King

E. N. Harshman
E. N. Harshman

Enclosures
HMC:ld
Copy to: Administrator
Harshman
Williams
Traver
Sub
Chron

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JAN 27 1955

224 New Customhouse
Denver 2, Colorado

January 13, 1955

Memorandum

To: Administrator, Defense Minerals Exploration Administration
Attention: 200

From: DMEA Field Team, Region IV

Subject: Report of Examination, DMEA Docket 3383 (Uranium), N. B. Knight, Horseshoe claims, San Juan County, Utah

Enclosed are four copies of the report of examination, a copy of the letter of denial to the applicant, and two copies of Form 3b.

W. H. King

E. N. Harshman

Enclosures

Denial to HB
to copy

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JAN 27 1955

[illegible]
Region IV

[illegible]

[illegible]

Memorandum

To: [illegible], Region IV

From: Chief, [illegible] Division, Region IV

Subject: Report of Examination, DMEA Docket [illegible] (Uranium), [illegible] Horse [illegible] Claims, San Juan County, Utah

Enclosed are eleven copies of the engineering report of examination [illegible] on the subject claims.

The applicant requested [illegible] to drive a [illegible] and [illegible] of [illegible] stripping.

The engineer [illegible] recommends a three stage drilling program estimated to cost a total of [illegible].

I concur in this recommendation provided the applicant shows valid title of the Horse [illegible] Claims.

W. H. King
[illegible] King

Enclosures

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JAN 27 1955

Region IV

Building 20, Room 137
Denver Federal Center
Denver 2, Colorado
October 21, 1954

Memorandum

To: Executive Officer, DMA Field Team, Region IV

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

Subject: DMA 1363 (Uranium) H. B. Knight, Sr. (Horseshoe Nos. 2 and 4 claims), San Juan County, Utah

Enclosed are the original and ten copies of a summary, conclusions, and recommendations by Randall Chew III, Geological Survey, and Glen Walker, Bureau of Mines, and Walker's engineering report on the subject docket.

Walker concludes, after making a field examination, at which time the examining team conferred with the applicant, that the area covered by the Horseshoe Nos. 2 and 4 claims is favorable for the discovery of uranium ore reserves. It has had favorable consideration by the Atomic Energy Commission for drilling at a due future time, and consequently, there is no question about them favoring a DMA project. Engineering estimates based on the Geological Survey's recommended exploration proposal calls for a project set up in three stages as outlined in the engineering report at a total over-all cost of $[illegible],632.00; Government participation, 75 percent or $[illegible],974.00. A unit-cost, short-form contract is suggested with the second and third stages requiring prior written Region IV Field Team approval.

I concur with Walker's conclusions and recommendations.

Before a contract is prepared, all five H. Knight claims should be subordinated in accordance with the applicant's letter of September 16, 1954.

The copy of the Geological Survey report furnished by their Denver Federal Center office and the brochure have been previously returned to you.

W. M. Brown

W. M. Brown

WMB/kp
enclosure
cc - 10
DMA (3)
Chron

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Defense Minerals Exploration Administration
Denver Federal Center
Denver 2, Colorado

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JAN 27 1955

August 15, 1954

Memorandum

To: DMEA Field Team, Region IV

From: A. H. Koschmann

Subject: DMEA Docket XXXX, M. B. Knight, Sr., Horsehoe claims Nos. 1 to 6, San Juan County, Utah

Enclosed are 10 copies of the geologic report by R. T. Chew, III, of the U. S. Geological Survey covering the above docket.

The applicant originally requested 500 feet of rim stripping on the Horsehoe Nos. 2 and 4 claims and 300 feet of drifting on the Horsehoe No. 2 claim. Mr. Chew believes that exploration is warranted and recommends a modified program of 8,500 feet of diamond drilling in three stages on the claims - stages 2 and 3 to depend upon the results of prior drilling.

The report was returned to the Grand Junction district office for minor revision than the cost figure in Mr. Williams' original letter of transmittal is not correct. The cost figures for the revised program will be furnished in the engineering report.

Enclosed are 9 extra copies of the maps accompanying Mr. Chew's report.

E. N. Hackman
for A. H. Koschmann
Supervising Geologist
Colorado-Wyoming

Enclosures (19)

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
P. O. Box 360
GRAND JUNCTION, COLO.

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JAN 27 1955

July 30, 1954

Memorandum

To: A. H. Koschmann, Field Team, Region IV

From: W. P. Williams

Subject: DMEA 3383, N. B. Knight, Sr., Horseshoe claims Nos. 1 to 6, San Juan County, Utah

Transmitted herewith are eleven copies of a geologic report by R. T. Chew, III, covering the subject DMEA application.

Chew recommends approval of a drilling program. His recommended plan is modified from the applicant's original proposal consisting of 900 feet of drift and 900 feet of rim stripping at an estimated cost of $30,202. Chew's alternate project is estimated to cost about $24,167.

We are also sending herewith nine extra copies of the maps accompanying Chew's report.

W P Williams
R.

W. P. Williams
Geologist

WPW/mlr

Enclosures

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMEA 1381, Keepsakes Nos. 2 and 4 claims

W. B. Knight, Sr.

San Juan County, Utah

Uranium

Randall Shaw III, Geologist
Geological Survey

Glen Walker, Mining Engineer
Bureau of Mines

October 19, 1954

June 1983

[redacted]
[redacted]
[redacted]

Summary, Conclusions, and Recommendations

by [redacted]
[redacted]
Geological Survey

[redacted]
[redacted]
Bureau of Mines

DMEA 183

MONTEZUMA NOS. 2 AND 4 CLAIMS
N. B. KNIGHT, SR.
SAN JUAN COUNTY, UTAH

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

By Randall Shaw III and Glen Walker

N. B. Knight, Sr., of Moab, Utah, made application for a loan under the Defense Production Act of 1950 to explore the Montezuma Nos. 2 and 4 mining claims for uranium. These two claims and three other adjoining claims are located in sec. 7, T. 33 S., R. 21 E., Salt Lake meridian, San Juan County, Utah. The application was designed to perform the exploration by 300 feet of rim stripping, 300 feet of adit driving, and rehabilitation of a log cabin at an estimated cost of $30,000.00.

A field investigation of the property by a Defense Minerals Exploration Administration Region IV examining team was made on July 7, 1954. On September 16, 1954, N. B. Knight, Sr., wrote the Region IV Field Team in response to their letter of September 1, 1954, suggesting exploration by core drilling only, that he concurred with the proposal as the most logical method of exploration and in the same letter agreed to subordinate all five Montezuma claims to the Government in the event a contract was entered into.

The Indian Creek mining district, especially the upper Cottonwood Canyon area where the claims are located, has been favorably considered by the Atomic Energy Commission for core drilling. The uranium-vanadium deposits are in the lower Chinle formation of the

Upper Triassic which in the vicinity of the Horseshoe claims is a sandstone from 75 to 100 feet thick underlain by an 8-foot basal conglomerate. The ore occurs near the bottom of this stratum and it has been traced along the rim for over 1,000 feet. However, it is not mineralized commercially for that distance, but does show scintillometer counts in newly exposed adits on the Horseshoe No. 2 claim and older mine workings on the Horseshoe No. 1 claim. Geological interpretation is that a concealed drainage channel trending roughly east-west is indicated in the conglomerate representing the ore-bearing horizon with the overlying Chinle sandstone forming abrupt cliff above. Production has resulted from mining operations in the conglomerate on the No. 1 claim.

A program involving only surface core drilling is recommended by the consulting team set up in three stages as a unit-cost, short-form contract. Stage I includes an access road to Horseshoe claims Nos. 2 and 4, drilling 30 AX diameter holes for an estimated 3,000 feet at $2.79 per foot or $8,370.00; Stage II, drilling 14 AX diameter holes for an estimated 1,400 feet at $2.69 per foot, or $3,766.00; and Stage III, drilling 41 AX diameter holes for an estimated 4,100 feet at $2.56 per foot or $10,496.00. The total over-all cost will be $22,632.00, Government participation $16,974.00. Stages II and III require prior written authorization by the Region IV Field Team.

UNITED STATES DEPARTMENT OF THE INTERIOR

DOUGLAS McKAY, SECRETARY

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JAN 27 1955

DEFENSE MINERALS EXPLORATION ADMINISTRATION
REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMEA 3383, N. B. Knight, Sr., Horseshoe claims Nos. 1 to 6
San Juan County, Utah

Uranium

Geologic Report

by

R. T. Chew, III
U. S. Geological Survey

July 30, 1954

INTRODUCTION

N. B. Knight, Sr., Moab, Utah, applied (DMEA 3383) on May 18, 1954, for assistance to explore for uranium. The field team, consisting of Glenn Walker and Manuel Robles representing the Bureau of Mines, and Randall T. Chew, III, and Fred A. Mumpton, representing the Geological Survey, examined the property on July 7, 1954, accompanied by Mr. Knight. The examination took one complete day.

The property is in Secs. 7 and 18, T. 33 S., R. 21 E., Salt Lake Base and Meridian, San Juan County, Utah. It can be reached by a dirt road which leaves U. S. Highway 160 about 16 miles north of Monticello and runs west about 25 miles to Dugout Ranch, thence south about 8 miles to the property. The road is graded and passable to passenger cars and trucks at all times except immediately after heavy rains.

The applicant requested assistance to drift 900 feet and strip 900 feet of rim at a total cost of $30,202. Upon completion of the field examination, and in later correspondence between the members of the field team, an alternate project consisting of about 8,500 feet of core drilling in three stages was agreed upon. The alternate project is recommended for approval.

The applicant listed under Item 3 of the application for aid, ten claims which would be benefitted by the proposed exploration. All the claims except the Horseshoe Nos. 2 and 4 have been leased to the Four Stages Uranium Company, and, therefore, this recommendation concerns the Horseshoe Nos. 2 and 4 claims only. The applicant is half owner of these claims. C. A. Frost owns the other half interest and has leased it to the applicant.

The location of the Horseshoe claims is shown on figure 1. The Chinle rim on the Horseshoe No. 2 claim has been stripped and three short drifts have been driven approximately as shown on figure 2. A sketch map of the underground workings on the Horseshoe No. 1 is also shown on the same map. The underground workings on the adjacent Horseshoe No. 1 claim cover an area about 200 by 100 feet and that ore body is considered to have been worked out.

GEOLOGY AND ORE DEPOSITS

The ore bodies on both the Horseshoe No. 1 and No. 2 claims are in the basal sandstone of the Triassic Chinle formation. In the Cottonwood Wash area this sandstone averages about 30 feet thick, though at the Horseshoe claims it is 75-100 feet thick because of channeling into the underlying Moenkopi formation. This basal sandstone thins to the north toward Lockhart Canyon, but may thicken again to form the basal Chinle sandstone which is mineralized in that area, too.

At the Horseshoe claims, the lowest 30 feet of the sandstone is irregularly bedded and the lowest 6 to 8 feet is a conglomerate with some cross-bedding. The middle 50 feet is nearly massive sandstone and the upper 15 to 20 feet of the unit is again irregularly bedded.

The lowest conglomerate is the ore horizon. At the Horseshoe No. 2, it is 8-feet thick. The conglomerate is both limy and siliceous and contains abundant well-rounded brown and orange chert or jasper pebbles averaging half an inch in diameter, as well as many siltstone seams and galls up to 1 foot in diameter. The matrix contains clear coarse quartz grains and white altered feldspar grains. Pyrite masses as much as 8 inches in diameter, but averaging about 1/8 inch in diameter, occur near the base of the conglomerate associated with abundant limonite. Carbon occurs in this same horizon as seams up to 6 inches long and less than 1/8-inch thick and also as sand-grain-sized specks. The carbon is mostly black, vitreous, and coaly. Some larger wood fragments in the overlying sandstone are replaced by limonite.

Radioactivity sufficient to indicate the presence of ore-grade material occurs in the vitreous carbon and adjacent to, but not in, the pyrite blebs. The ore is spotty on the Horseshoe No. 2, but is localized near the bottom of the conglomerate. In the ore body on the Horseshoe No. 1, it was more continuous. Yellow and yellow-green secondary uranium minerals have formed on the walls in the damp parts of the mine workings, but no other uranium minerals were noted during the field investigation. Carlson and Dix (1953) report pitchblende visible in polished sections and associated with sulfides that replace fossil logs in the Horseshoe No. 1. They also report the presence of fossil logs 2 feet thick and 12 feet long in all three sandstone units.

The ore body on the Horseshoe No. 1 claim has probably been mined out and there has been no extensive exploration for other ore bodies. The Horseshoe No. 1 produced 869.48 tons of ore averaging .23 percent U_3O_8 in the period from July 1951 to March 1954, according to AEC Finance Division figures. There has been no production for major exploration on the other claims in the area. No reserve estimates have been computed because of the lack of specific information.

The Cottonwood Wash-Hop Canyon area, of which the Horseshoe claims are a part, has not been extensively explored. Five diamond-drill holes are being drilled on the same channel about half a mile east of the Horseshoe claims. The mine on the Horseshoe No. 1 is the only extensive mining operation in the area. The nearest producing area is on Elk Ridge about 15 miles to the southwest.

Carlson and Dix have recommended that the Atomic Energy Commission do 15,000 feet of core drilling in the Cottonwood Wash area, beginning on the Horseshoe No. 1 and, if favorable results are obtained, continuing eastward along the channel. In a conversation between the writer and H. B. Wood of the AEC, it was decided that work under a DMEA contract would be preferred to work by the AEC because of the greater likelihood of the Government receiving a return on its investment.

RECOMMENDATIONS

The project approved here includes only the Horseshoe Nos. 2 and 4 claims, the remainder have been leased to others. The applicant owns a half interest in the subject claim and has leased the other half interest from C. A.Frost.

The applicant's original proposal was for approximately 900 feet of rim stripping on the Horseshoe Nos. 2 and 4 claims and for approximately 900 feet of drifting on the Horseshoe No. 2. The stripping would allow inspection of the contact between the Chinle and Moenkopi formations most of which is now covered. The drifting would test the ore zone which is exposed in the drift and cut already made.

After examination of the property, the examining team decided that an equivalent amount of money could be used better in core drilling which would more thoroughly test the ground behind the rim than would the applicant's proposed drifting and stripping. A three-stage program has been devised. Stage I would test the ground which is considered most likely to contain a minable ore deposit. Stage II tests the ground along the paleostream channel and would be drilled if the Stage I drilling proved successful. Stage III tests the flanks of the paleostream channel and would only be done if minable ore is found in Stage I and/or Stage II.

All three stages would consist of core drilling, the drill holes to be 100 feet apart, forming north-south trending fences 150 feet apart. The holes in adjacent fences are to be staggered 50 feet so that a given hole is half way between two holes in the neighboring fence. The suggested locations for the holes are shown on Figure 2.

Stage 1.-- 30 holes are to be drilled immediately behind the workings on the Horseshoe No. 2 claim in five fences, as specified earlier and as shown on Figure 2. The first hole in each fence should be 50 to 100 feet behind the rim, but the offsetting of each fence must be rigidly adhered to.

The Stage I drilling will test the area where it is thought a minable ore deposit is most likely to be found. The area is behind the mineralization at the rim on the Horseshoe No. 2 claim and lies in a direction parallel to the stream flow from the Horseshoe No. 1 ore body.

Stage II.--14 holes are to be drilled immediately west of the area drilled in Stage I. This area is considered to be favorable for ore deposition also, especially if ore is found in the Stage 1 drilling. The area to be tested lies in a direction parallel to the stream flow from both the Horseshoe No. 1 and No. 2 ore bodies, but is farther removed from the Horseshoe No. 1 ore - the only ore body that has so far been proven in this channel.

Stage II should be authorized if any holes in Stage I are favorable, even though no minable ore body is found in Stage I. Favorable holes in Stage I will indicate a continuation of lithologic conditions favorable for ore deposition even though no ore may be found, and there is a good chance that ore may be found in Stage II even though none is found in Stage I. If Stage I shows no favorable holes, Stage II would not be necessary for favorable lithologic conditions would then be shown not to continue parallel to the direction of stream flow and there would be little likelihood of finding a minable ore body farther west.

Stage III.-- 41 holes would be drilled north of the areas covered in Stages I and II and would complete drilling of the two claims. The holes would be continuations of the fences in Stages I and II.

Stage III should be authorized only if minable ore is found in either Stages I or II. Stage III will test the ground farther up on the flanks of the channel but not in a direction parallel to the stream flow from any of the ore bodies that might be found by the earlier drilling. Experience on the Colorado Plateau has shown that ore deposits tend to occur on the flanks of the channels rather than in the center. The center of this channel, according to Carlson and Dix (1953) is immediately south of the rim on the Horseshoe Nos. 2 and 4. Therefore, any ore found on these two claims as a result of Stage I and Stage II will be relatively close to the center of the channel and it seems possible that more might be found farther up on the flanks.

Field examination, geologic study of the property, and a knowledge of the size and distribution of ore bodies in the vicinity of the horseshoe claims indicate that the hole spacing as shown on figure 2 is optimum for the discover of new ore.

Each drill hole should be sampled once at the ore horizon and the samples assayed for uranium and copper. Any ore or mineralized holes should be offset on 50-foot centers borrowing footage from the succeeding stages.

There appears to be a reasonable possibility that there is undiscovered ore in the paleostream channel. Although the ore showing at the surface on the Horseshoe No. 2 is thin, it is similar to the occurrence on the Horseshoe No. 1. The presence of sulfides and the abundant limonite, which could logically have had sulfides as a source, strengthens the possibility of a minable ore body. Sulfides are a fairly reliable guide to ore in Triassic uranium deposits and are associated with ore bodies which are often of higher than usual grade.

About 1-1/4 miles of access road are necessary before drilling can begin. This will be provided by the applicant as part of his share of Stage I. Water for drilling is available in the canyon below the mine, necessitating a haul of about 1-1/4 miles.

Work on the contract could probably begin within a few weeks after the date of the DMEA contract, and completion of the three stages would take about five months.

It is recommended that the project as outlined be approved and a DMEA contract prepared.

Carlson, W. A., and Dix, G. P. Recommendation for drilling Hop Canyon area, San Juan County, Utah, U. S. Atomic Energy Commission RME-34 (confidential), 1953.

DEPARTMENT OF THE INTERIOR
Colorado Minerals Administration
RECEIVED
JAN 27 1955

DMRA 3383

BONANZA NOS. 8 AND 9 CLAIMS
M. D. HENSLEY, SR.
SAN JUAN COUNTY, UTAH

Engineering Report

By Glen Walker
Mining Engineer
Bureau of Mines

October 19, 1954

DMEA 3383

MORRISHOE NOS. 2 AND 4 CLAIMS
E. B. KNIGHT, SR.
SAN JUAN COUNTY, UTAH

CONTENTS

Engineering Report — Page

Introduction..... 1
Acknowledgments..... 1
Location, topography, and physical features..... 2
History and production..... 3
Ownership and extent..... 4
Description of the deposit..... 4
Present status..... 5
  Exploration and development..... 5
  Mining and milling equipment and other facilities..... 5
Project proposals with costs..... 6
  Summary of costs..... 10
Conclusions..... 10
Recommendations..... 10

ILLUSTRATIONS

Figure — Follows page

1. Location map, Morrishoe Claims Nos. 2 and 4, E. B. Knight, Sr., San Juan County, Utah..... 2
2. Sketch map of Morrishoe claims showing mine workings and location of drill holes recommended for drilling with DMEA aid..... *
3. Map showing workings on Morrishoe claim No. 2, E. B. Knight, Sr., San Juan County, Utah..... 5

*See figure with geologic report.

NMMA 3383

BONANZA NOS. 2 AND 4 CLAIMS
E. R. KNIGHT, SR.
SAN JUAN COUNTY, UTAH

ENGINEERING REPORT

By Glen Walker

INTRODUCTION

E. R. Knight, Sr., of Moab, Utah, has made application for Defense Minerals Exploration Administration assistance in exploring for uranium ores on two mining claims, Bonanzas Nos. 2 and 4 in sec. 7, T. 33 S., R. 24 E., Salt Lake meridian, along Cottonwood Canyon in the Indian Creek District of San Juan County, Utah. The proposed project under NMMA 3383, stipulated 500 feet of rim stripping, 500 feet of adit, and rehabilitation of a log cabin at an estimated cost of $30,000.00.

An examination of the property was made in the field on July 7, 1954, by Region IV representatives of the Geological Survey and Bureau of Mines.

ACKNOWLEDGMENTS

The examining team, consisting of Randall Chew III and Fred A. Hampton of the Geological Survey, Manuel Rubin and the writer of the Bureau of Mines, was accompanied by the applicant, E. R. Knight, Sr., who concurred with the exploration proposed in this report. He furnished helpful information regarding the property and acted as guide to the team.

LOCATION, TOPOGRAPHY, AND GENERAL FEATURES

The unpatented Horseshoe claims, Nos. 1, 2, 3, 4, and 5 are in secs. 7 and 18, T. 33 S., R. 23 E., Salt Lake meridian (fig. 1), on the north side of an unnamed box canyon about 1/2 mile long, which is tributary to Cottonwood Canyon on the west. The general area is designated as the Indian Creek district of San Juan County, Utah.

In this vicinity the topography is typical of the Colorado Plateau region, in which mesas have been dissected by stream and wind action, forming abrupt bluffs of the more resistant strata. Differences in altitude at the property vary from 500 to 700 feet. Access to mesa tops and to some uranium-bearing horizons is a major problem in exploration of the area.

The region is endowed with most of the normal 12 inches of precipitation falling as snow and midsummer rains, frequently of cloudburst proportions. Generally, weather conditions permit year round mining activity, except for occasional snow storms and short periods during the spring thaws. Adequate water for drilling and mining use can be obtained from a perennial spring at the confluence of the box canyon and Cottonwood. The haul to the mine adit would be about 1/2 mile, and to a drill rig situated on the mesa, about 1-1/2 miles.

Juniper and pinon, none of which is suitable for small mine timber, grow in abundance on the property. Ponderosa pine of small and post size is readily available in the Abajo Mountains, a few miles south. In these mountains there are also several small sawmills from which dimension lumber can be obtained at comparatively reasonable cost.

A good, dry-weather, secondary road, 33 miles in length, connects the property with U. S. Highway 160 at a point 16 miles north of Monticello. The nearest railhead, Crescent Junction, is approximately 140 miles northeast. The majority of the manpower and mining supplies can be procured in either Moab or Monticello, but the diamond drilling repairs and supplies would very probably have to be shipped from Grand Junction, Colo., or Salt Lake City, Utah. Although there are no living facilities on the property, an old log cabin about 1/4 mile away in Cottonwood Canyon has been rehabilitated by the applicant, and will accommodate an adequate number of men to complete the proposed work.

HISTORY AND PRODUCTION

Only one load, about 10 tons, of ore is reported to have been produced from the Horseshoe Nos. 2 and 4 claims. It is said to have contained 0.10 percent U_3O_8 and 0.04 percent V_2O_5. An adjoining claim, the Horseshoe No. 1, is reported to have produced 900 tons of uranium ore valued at $30,000.00. This production was made by the applicant and came from the horizon to be prospected. The Atomic Energy Commission credits a production of 869.4 tons with an average content of 0.20 percent U_3O_8 and 0.02 percent V_2O_5 to this claim. These figures indicate a gross value for the ore of slightly over $31,000.00. About a mile air line east of this property there was a core drilling project in progress at the time of the examination, but no information concerning the results was available.

OWNERSHIP AND EXTENT

From the field examination of the location notices and affidavits of assessment work performed and correspondence with the applicant, it appears there is sufficient evidence that he has rights to the land involved. Should the proposed exploration be deemed worthy of a contract, it is suggested that signature of the appropriate party be obtained on form NF-203 "Owner's Consent to Lien" covering all five Horseshoe claims, although the exploration is to be performed on only the Nos. 2 and 4 claims.

DESCRIPTION OF THE DEPOSIT

The uranium-vanadium deposits discovered to date in the upper Cottonwood Canyon area are in the lower Chinle formation of the Triassic. This formation on the applicant's ground is a sandstone 75 feet to 100 feet thick with an 8-foot basal conglomerate. The ore minerals occur near the bottom of this stratum. The mineralized conglomerate was traced along the rim for over 1,000 feet to the Horseshoe No. 1 mine by the Geological Survey member of the examining team. It should not be interpreted that this formation is commercially mineralized for this distance, but scintillator counts in the newly excavated adits and the older workings of the Horseshoe No. 1 claim indicated the conglomerate to be the ore-bearing horizon. According to geological interpretation, an old buried drainage channel trending roughly east-west is overlain by the sandstone forming the abrupt cliff.

Where the ore-bearing conglomerate could be examined in accessible openings and outcrops, it contained rounded pebbles of quartz and sandstone, varying in size up to 2 inches with some interstitial

line. Carbonaceous matter in pieces up to 6 inches in diameter and 2 feet long were noted in this rock. The contained ore minerals are the usual yellow and green varieties of uranium and vanadium uraninite has been reported from the Horseshoe No. 1 claim by the Atomic Energy Commission. The conglomerate is immediately underlain by gray sandstone of undetermined thickness.

PRESENT STATUS

Exploration and Development

On Horseshoe No. 4 claim only some superficial cuts have been made along the outcrop of the ore-bearing horizon. Figure 3 shows the location and extent of the present workings on Horseshoe No. 2 claim. The eastern-most adit on the Horseshoe No. 2 claim was the original attempt to explore the deposit, but it has caved to an extent which obviates testing the ore grade. The middle adit was driven next in chronological order. As may be assumed from its branching appearance, the rock here seems to be more mineralized in the west face. Although the western adit has penetrated the formation only 8 to 10 feet, the indications of mineral are comparable to the middle workings.

Mining and Milling Equipment and Other Facilities

The following equipment was on hand at the time of the examination:

1 Gardner-Denver 210-c.f.m. portable air compressor
1 1/2-ton (estimated) rubber-tired, 3-wheel muck cart for mule haulage
1 D4 Caterpillar tractor with angle dozer
1 jackleg with 50-lb. jackhammer
20 gal. pressure water tank
1 500-watt gasoline driven DC generator for lights
Air and water hoses (50 feet of each)
Several pieces of jackhammer drill steel and detachable bits
1 burro.

The applicant stated that any or all this equipment will be used for the benefit of the proposed work.

An old log cabin about 3/4 mile away in Cottonwood Canyon has been rehabilitated by the applicant. There is no mill available nearer than Monticello, Utah, about 50 miles distance where any ore produced would be shipped for treatment.

PROJECT PROPOSALS WITH COSTS

The project proposed by the applicant included:

900 feet of rim stripping at $3.00 per foot (by bulldozer)	$ 2,700.00
900 feet of tunnel at $30.00 per foot	27,000.00
Rehabilitation of cabin	500.00
Total cost	$30,200.00

After the examination was completed, it appeared that the property could be more adequately explored by a pattern of core drill holes and the applicant agreed by letter to the Region IV Field Team, dated September 16, 1954. The suggested operation would be conducted in three stages with access road construction as part of the first. Coring is thought to be the most practical method for sampling the ore horizon because of its excessive moisture content.

Stage I includes approximately 1-1/2 miles of access road to be built by the applicant with his bulldozer. Also in Stage I, 30 AX diamond core holes would be drilled from the top of the bluff to the ore horizon, an estimated depth of 100 feet. These holes would be 100 feet apart in staggered rows 150 feet apart beginning as close to the rim as practical and continuing in a northerly direction parallel to the side lines of and only on the Horseshoe Nos. 2 and 4 claims,

as shown on figure 2 of the geological report. Chemical analyses of the split core from the ore horizon would be made on each hole; the remainder of the core should be retained for geological examination by the Government.

Stage II consists of 14 AX diameter core holes drilled on the same pattern as those in Stage I, but in the area immediately west of Stage I. Sampling and analysis are to be similar to Stage I also. This part of the project will be pursued in the event any hole of Stage I is favorable, lithologically.

Stage III, consisting of 41 AX diameter holes in the area north of the ground drilled in the first two stages, would be authorized only if minable ore is discovered by the foregoing work. The sampling and analytical work is to be performed the same as that outlined under Stage I.

All highly mineralized holes would be offset at 50-foot intervals by additional cores, the footage consumed in this manner to be subtracted from succeeding stages. This provision could, of course, considerably reduce the number of holes recommended for Stage III. In that event, it is suggested that the location of Stage III holes be such as to further the information previously obtained and to also retain the original pattern. An increased hole depth over that estimated would also have the effect of reducing the number of holes.

No particular difficulty is anticipated in the drilling operation, as it will be necessary to core only an occasional hole from the collar to ascertain the depth to the ore horizon. The overburden is massive, homogeneous sandstone which should retain circulating water rather well.

The accurate location of holes according to the suggested pattern and the examination of ore horizon core are to be the responsibility of a part-time geologist hired by the applicant. This service is necessary because the applicant has indicated his inability to interpret core sufficiently to ascertain the horizon to which the bit has penetrated in a particular hole. Stages II and III will require prior written authorization by the Region IV Field Team.

The following is an itemized cost estimate of the project as outlined:

Stage I

Construct 1-1/2 mile access road

Labor and supervision		
Applicant at $500.00 per month for 1/2 month	$ 250.00	
Geologist at $500.00 per month for 2 months	1,000.00	
Total labor and supervision		$1,250.00
Operating materials and supplies		
Fuel oil and grease for 1/2 month for bulldozer	21.25	
Total operating supplies		21.25
Operating equipment		
Rental: depreciation $3,000.00 D4 "Cat" at $50.00 per month for 1/2 month	25.00	
Total operating equipment		25.00
Contract		
3,000 feet AX diameter core drilling in 30 holes at $2.25 per foot	6,750.00	
Total contracts		6,750.00
Miscellaneous		
Bookkeeping (by applicant) at $50.00 per month for 2-1/2 months	125.00	
Compensation insurance, Social Security, unemployment tax, etc. at 5 percent of $1,250.00	62.50	
30 chemical assayers at $3.00	90.00	
Total miscellaneous		277.50
Total Stage I		$8,323.75

Cost per foot $8,323.75/3,000 = $2.79

Stage II

Contract		
1,400 AX diameter core drilling in 14 holes at $2.25 per foot	$3,150.00	
Total contract		$3,150.00
Labor and supervision		
Geologist at $500.00 per month, 1 month	500.00	
Total labor and supervision		500.00
Operating materials and supplies		
None		
Operating equipment		
None		
Miscellaneous		
Bookkeeping (applicant) at $50.00 per month, 1 month	50.00	
14 chemical analyses at $3.00	42.00	
Compensation insurance, Social Security, unemployment tax, etc. 5 percent of $500.00	25.00	
Total miscellaneous		117.00
Total Stage II		$3,767.00

Cost per foot $3,767.00/1,400 = $2.69

Stage III

Contract		
4,100 feet AX diameter core drilling in 41 holes at $2.25 per foot	9,225.00	
Total contract		9,225.00
Labor and supervision		
Geologist at $500.00 per month for 2 months	1,000.00	
Total labor and supervision		1,000.00
Operating materials and supplies		
None		
Operating equipment		
None		

Miscellaneous		
Bookkeeping (applicant) at $50.00 per month for 2 months	$ 100.00	
41 chemical analyses at $3.00	123.00	
Compensation insurance, Social Security, unemployment tax, etc. 5 percent of $1,800.00	90.00	
Total miscellaneous		$ 313.00
Total Stage III		$10,498.00

Cost per foot $10,498.00/4,100 = $2.56

Summary of Costs

Contracts	$19,125.00
Labor, supervision, and technical services	2,750.00
Operating materials and supplies	81.85
Operating equipment	25.00
Miscellaneous	667.70
Total cost of project	$22,648.75

CONCLUSIONS

The proposed project on the Horseshoe property would tend to explore geologically favorable ground in the vicinity of a former productive uranium mine. This particular district has received favorable attention from the Atomic Energy Commission geologists, who have recommended drilling several thousand feet in the area, but pressure of other work has delayed this work.

RECOMMENDATIONS

It is recommended that Government assistance for exploration on the Horseshoe claims be granted the applicant and a short-form, unit-cost contract be prepared in three stages to include the following:

Stage I

1. Construct an access road approximately 1-1/2 miles from Cottonwood Canyon to the top of the mesa covered by Horseshoe Non. 2 and 4 claims

2. Drill an estimated 3,000 feet of AX diameter surface core drill holes (30) at $2.79 per foot $8,370.00

Stage II

Drill an estimated 1,400 feet of AX diameter core holes (14) at $2.69 per foot 3,766.00

Stage III

Drill an estimated 4,100 feet of AX diameter core holes (41) at $2.56 per foot 10,496.00

Total cost of project $22,632.00

Over-all cost per foot $22,632.00/8,500 = $2.66

The Government participation in a uranium loan will be 75 percent of $22,632.00, or $16,974.00.

/rmp

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

224 New Customhouse
Denver 2, Colorado

Defense Minerals Administration
RECEIVED
DEC 10 1954

December 7, 1954

Memorandum

To: Administrator, Defense Minerals Exploration Administration

From: Field Team, Region IV

Subject: Report of Examination, DMEA Docket 3383, (Uranium) N.B. Knight, Sr., Horse Shoe claims, San Juan County, Utah.

The application for Government assistance in exploration work estimated to cost $22,632.00, has been approved by us and a contract will be prepared if the claims are valid.

Four copies of the Report of Examination and two copies of Form 3b will be forwarded with your copy of the contract.

W. H. King
W. H. King

E. N. Harshman
E. N. Harshman
for A. H. Koschmann

Defense Minerals Administration
RECEIVED
DEC 10 1954

224 New Customhouse
Denver 2, Colorado

December 7, 1954

Memorandum

To: Administrator, Defense Minerals Exploration Administration

From: Field Team, Region IV

Subject: Report of Examination, DMEA Docket 1363, (Uranium) E.B. Knight, Sr., Horse Bone claims, San Juan County, Utah.

The application for Government assistance in exploration work estimated to cost $22,632.00, has been approved by us and a contract will be prepared if the claims are valid.

Four copies of the Report of Examination and two copies of Form 3b will be forwarded with your copy of the contract.

W. H. King
W. H. King

E. N. Harshman
E. N. Harshman
for A. H. Koechmann

Bureau of Land Management
Lands Administration
RECEIVED

224 New Customhouse
Denver 2, Colorado

October 27, 1954

Mr. N. B. Knight
P. O. Box 154
Moab, Utah

Re: Docket No. DMEA 3383

Dear Mr. Knight:

This will acknowledge receipt of your letter dated September 30, 1954, in which you stated that you would forward this office copies of the recorded notices of location on your claims, validated under Public Law 250 in 1952.

We have not as yet received copies of the recorded notices of location and we are unable to continue to process your contract until we receive them. Will you please advise.

Very truly yours,

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

HMC:dm

cc: Subject
AHKoschmann
ALBrokaw
WMTraver
HMConnors
Administrator
Chron

DEPARTMENT OF THE INTERIOR
Lease Minerals Administration
RECEIVED
SEP 30 1954

22A New Customhouse
Denver 2, Colorado

September 27, 1954

Mr. N.E. Knight
P.O. Box 154
Moab, Utah

Re: Docket DMEA 3383

Dear Mr. Knight:

This will acknowledge receipt of your letter dated September 23, 1954, which gave the dates of location and recording data on the five Horseshoe claims.

A check of the records at the Bureau of Land Management in Salt Lake City indicates that an oil and gas lease covering all of Section 7, T. 33 S., R. 21 E., has been issued. The application for this oil and gas lease was filed November 17, 1950, which indicates that this land was withdrawn from mineral entry prior to the dates of location of your Horseshoe claims.

It appears to us that you still have time to validate your claims under the provisions of Public Law 585 of the 83rd Congress. When you submit proof to this office that you have complied with the provisions of Public Law 585 and have thereby validated your Horseshoe claims, we will continue to process your contract.

Very truly yours,

W. E. King
Executive Officer, DMEA
Field Team, Region IV

HMC:dm
cc Subject
Chron
AHKeschmann
ALBrokaw
Administrator
Members
Traver

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

224 New Customhouse
Denver 2, Colorado

September 1, 1954

Mr. N. B. Knight, Sr.
Box 154
Moab, Utah

Re: Docket DMEA-3383 (Uranium), Horseshoe Claims, San Juan County, Utah

Dear Mr. Knight:

A review of your application and the reports of the field examiners indicate that further consideration should be given to the type of exploration amenable to your claims.

The usual DMEA procedure for exploring an area such as your Horseshoe group is core drilling, because more information can be obtained by this method at less cost than drifting. Your proposed exploration contemplated rim stripping and drifting with no core drilling.

Your attention is invited to Section 2 of the enclosed DMEA Order 1 defining "Exploration Projects". If ore is found by core drilling under a Defense Minerals Exploration Administration contract, further DMEA funds are not available to mine the ore or make preparation for mining.

It is noted that you own a half interest in the five Horseshoe Claims, but that you wish to subordinate to the Government the two center claims only. Defense Minerals Exploration Administration work on any claim or claims will likely benefit the entire group of Horseshoe Claims and, therefore, the whole group should be subordinated in the event a contract is entered.

Further consideration will be given your application on the basis of exploration by core drilling, provided that the five claims in the Horseshoe group are subordinated to the government. If you concur in this, please advise so that we may continue to process your application.

If we receive no reply to this letter within thirty days, we will presume that you are no longer interested in the exploration project and we will close the docket.

Yours very truly,

W. H. King
DMEA Field Team, Region IV

HMC:mb

cc: Docket
Chairman, Operating Comm.
Administrator, DMEA
WMTraver
AHKoschmann
Arnold Brokaw
Chron.

E. N. Kuschmann
for A. H. Koschmann
DMEA Field Team, Region IV

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

224 New Customhouse
Denver 2, Colorado

September 1, 1954

Mr. N. B. Knight, Sr.
Box 154
Moab, Utah

Re: Docket DMEA-3383 (Uranium), Horseshoe Claims, San Juan County, Utah

Dear Mr. Knight:

A review of your application and the reports of the field examiners indicate that further consideration should be given to the type of exploration amenable to your claims.

The usual DMEA procedure for exploring an area such as your Horseshoe group is core drilling, because more information can be obtained by this method at less cost than drifting. Your proposed exploration contemplated rim stripping and drifting with no core drilling.

Your attention is invited to Section 2 of the enclosed DMEA Order 1 defining "Exploration Projects". If ore is found by core drilling under a Defense Minerals Exploration Administration contract, further DMEA funds are not available to mine the ore or make preparation for mining.

It is noted that you own a half interest in the five Horseshoe Claims, but that you wish to subordinate to the Government the two center claims only. Defense Minerals Exploration Administration work on any claim or claims will likely benefit the entire group of Horseshoe Claims and, therefore, the whole group should be subordinated in the event a contract is entered.

Further consideration will be given your application on the basis of exploration by core drilling, provided that the five claims in the Horseshoe group are subordinated to the government. If you concur in this, please advise so that we may continue to process your application.

If we receive no reply to this letter within thirty days, we will presume that you are no longer interested in the exploration project and we will close the docket.

Yours very truly,

W. H. King

W. H. King
DMEA Field Team, Region IV

HMC:mb

cc: Docket
Chairman, Operating Comm.
Administrator, DMEA
WMTraver
AHKoschmann
Arnold Brokaw
Chron.

E. M. Haschmann
for A. H. Koschmann
DMEA Field Team, Region IV

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
JUN - 7 1954

224 New Customhouse
Denver 2, Colorado

June 4, 1954.

Memorandum

To: Administrator, Defense Minerals Exploration Administration
Attention: Code 200

From: Executive Officer, DMEA Field Team, Region IV

Subject: Docketing for Exploration Assistance

Enclosed herewith in duplicate is DMEA Form 3a and MF-103 and supporting data pertaining to the following applications for Government assistance in exploration work:

Vaughey and Vaughey (Uranium)
Garfield County
Utah

N. B. Knight, Sr. (Uranium)
San Juan County
Utah

W. H. King

W. H. King

Enclosures

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

Form Approved
Budget Bureau No. 42-R1036

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
JUN - 7 1954

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. 3383
Metal or Mineral Uranium
Date Received
Estimated Cost $30,202
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: N. B. Knight, Sr. Box 154 Moab, Utah
None
None
None

(*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 Horseshoe Claim No. 2 & 4 Located in Section 7 Township 33S, Range 21E S.L.B.M. Owns one half interest. C. A. Frost Owns other half interest. Horseshoe No. 3 & 1, Deer Trail No. 1, 2, 3, 4, 5, & 6, Mule Shoe No. 2 & 3

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

(*c*) State your interest in the land, whether owner, lessee, purchaser under contract, or otherwise Owner of one half interest in Horseshoe No. 2 & 4

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

(*e*) If you own the land, describe any liens or encumbrances on it None

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

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

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

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

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

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

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

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

(*c*) The work will start within ....30.... days and be completed within ....18.... months from the date of an exploration project contract.

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

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

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

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

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

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

(*e*) *Rehabilitation and repairs.*—Furnish a detailed list showing the cost of any necessary initial rehabilitation or repairs of existing buildings, installations, fixtures, and movable operating equipment, now owned by the Operator and which will be devoted to the exploration project.

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

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

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

NOTE.—No items of general overhead, corporate management, interest, taxes (other than payroll and sales taxes), or any other indirect costs, or work performed or costs incurred before the date of the contract, should be included in the estimate of costs.

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

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

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

Explain in detail on acompanying paper.

CERTIFICATION

The undersigned, whether as an individual, corporate officer, partner, or otherwise, both in his own behalf and acting for the applicant, certifies that the information set forth in this form and accompanying papers is correct and complete, to the best of his knowledge and belief.

Dated May 18, 1954

N B Knight Sr
(Applicant)

By .....

RECEIVED MAY 19 1954 U.S.A.E.C. Domestic Uranium Branch Grand Junction Office

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

APPLICATION - N. B. Knight, Sr.

No. 3 Applicant property right claim that will benefit by exploration project.

		Recorded	Book	Page
Mule Shoe #2	Entry No. 1998	1/17/53	19	114
Mule Shoe #3	1999	1/17/53	19	115
Deer Trail #1	F2588	1/26/54	51	232
Deer Trail #2	F2589	1/26/54	51	232
Deer Trail #3	F2590	1/26/54	51	233
Deer Trail #4	F2591	1/26/54	51	233
Deer Trail #5	F2592	1/26/54	51	234
Deer Trail #6	F2593	1/26/54	51	234
~~Deer Trail #7~~				
Horseshoe #3	E1125	9/23/52	17	6
Horseshoe #1	E1123	0/23/52	15	235

No. 4 Physical Description, Rim has been striped for about 400 feet along the Contact between the Shinarup & the Moencopey. Three tunnels have been driven to a distance of about 20 or 30 ft. One lot of ore has been produced which the assay was .10 U308 and .04 V205. No ore in reserve. Mine is accessible by Trucks and Cars. Horseshoe 2 & 4

The ore occurs along the contact between the Moencoppy and the Shinarup and this section seems to be well mineralized.

Good truck roads running to Property. Forty-Nine miles to Monticello. Thirty-three miles of dirt road and sixteen miles of oil

Man power seems to be plentiful at this time. Material is plentiful and supplies of water are available in the tunnels. I have my own equipment. There is no Power line near

No. 5 The Exploration Project A. Uranium

B. Striping rim & tunnel. Would be about 900 ft of stripping rim. Extimated cost of $3.00 per foot. Stripping would be along the contact between the Moencopy and Shinarup formation.

C. Work will start within thirty days after contract is complete.

D. The Applicant has had 40 years of mining experience and I also have the ability to supervise the project.

6. Estimated cost of tunnel 900 ft. long would be $30.00 per ft.

A. No independent contract. Bulldozer Cost per hour $8.00 for R.D.4 Catipillar.

B. Labor supervision $2.50 per hour, Miners $2.15 an hour, Common Labor $1.75 per hour about $500.00 for consulting Engineer and Geological Engineer.

C. Water is handy. Cost of about $1.00 per barrel to handle. Gas is 26¢ a gallon at Bulk plant. Diesel 16¢ a gallon.

D. Operating Equipment. The operator will furnish Compressor, Jackhammer Jack tank, hoses, Drill Steel and Mine Car. All mine equipments present value

at about $3,000.00. R. D.4 Cat, blade, and bucket present value about $3,500.00. Will have to rent loader at about $300.00 a month.

E. Rehabilitation & repairs. Cabin to be reroofed and plastered. Cost about $500.00

F. No new buildings. Improvements on cabin.

G. Cost of maintaining operating equipment about $100.00 per month. Assaying and samples about $100.00. Accounting and part time labor about $100.00 a month. Compensation, employer's liability about 10%.

April 18, 1954

N B Knight Sr

Applicant

Moab, Utah
May 20, 1954

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

Dear Sir:

This is in answer to your letter regarding my application for DMEA assistance, (Uranium).

With regard to Item 3 (a) I am forwarding the deed to one that I am owner with G. A. Frost of Horseshoe Claims Nos. 2 and 4. I am leasing Mr. Frosts half interest from him and am paying him 20% royalty on his half interest.

I am the owner and original locater of Deer Trail Claims Nos 1 to 6. Mr. Frost and I are the owner and original locaters of Mule Shoe Claims Nos 1, 2, and 3.

Following is the "Estimate of Costs", under Item 6.

Cost of 800 ft of tunnel @ $30.00 per ft.	$27,000.00
Cost of Stripping rim at $3.00 per ft.	2,700.00
	$29,700.00

Cabin Rehabilitation:

500 ft of lumber @ 10¢ per ft.	50.00
Roofing paper, 8 rolls at $6.50 per roll	52.00
Plaster, 52 yds. at $2.50 per yd.	130.00
Transportation of Material	50.00
Labor	180.00
	$462.00

TOTAL COST $30,162.00

Yours truly,

N. B. Knight

N B Knight

ENTRY NO. [illegible]

RECORDED [illegible] AT [illegible] M. BOOK [illegible] PAGE [illegible]

FEE PAID

SAN JUAN COUNTY RECORDER

$ [illegible]

[illegible]

Kent Frost and Fern Frost, John D. Lewis and Pearl M. Lewis, Grantors of Monticello, San Juan County, Utah, hereby quit claim all of their right, title and interest, for and in consideration of $10. and other good and sufficient considerations, a one half undivided interest to each of N. B. Knight and G. Alfred Frost, grantees of [illegible] San Juan County, [illegible], [illegible] Utah

Horse shoe No.1, Hose shoe No. 2, Horse Shoe No. 3
Horse shoe No. 4 and Horse Shoe no. 5, mining claims situated in Section 6 Township 33 South Range 21 East SLM.
In San Juan County Utah

Witness the hands of the said grantors this 23rd day of June, 1952

Kent Frost

Sincerely

C. Alfred Frost

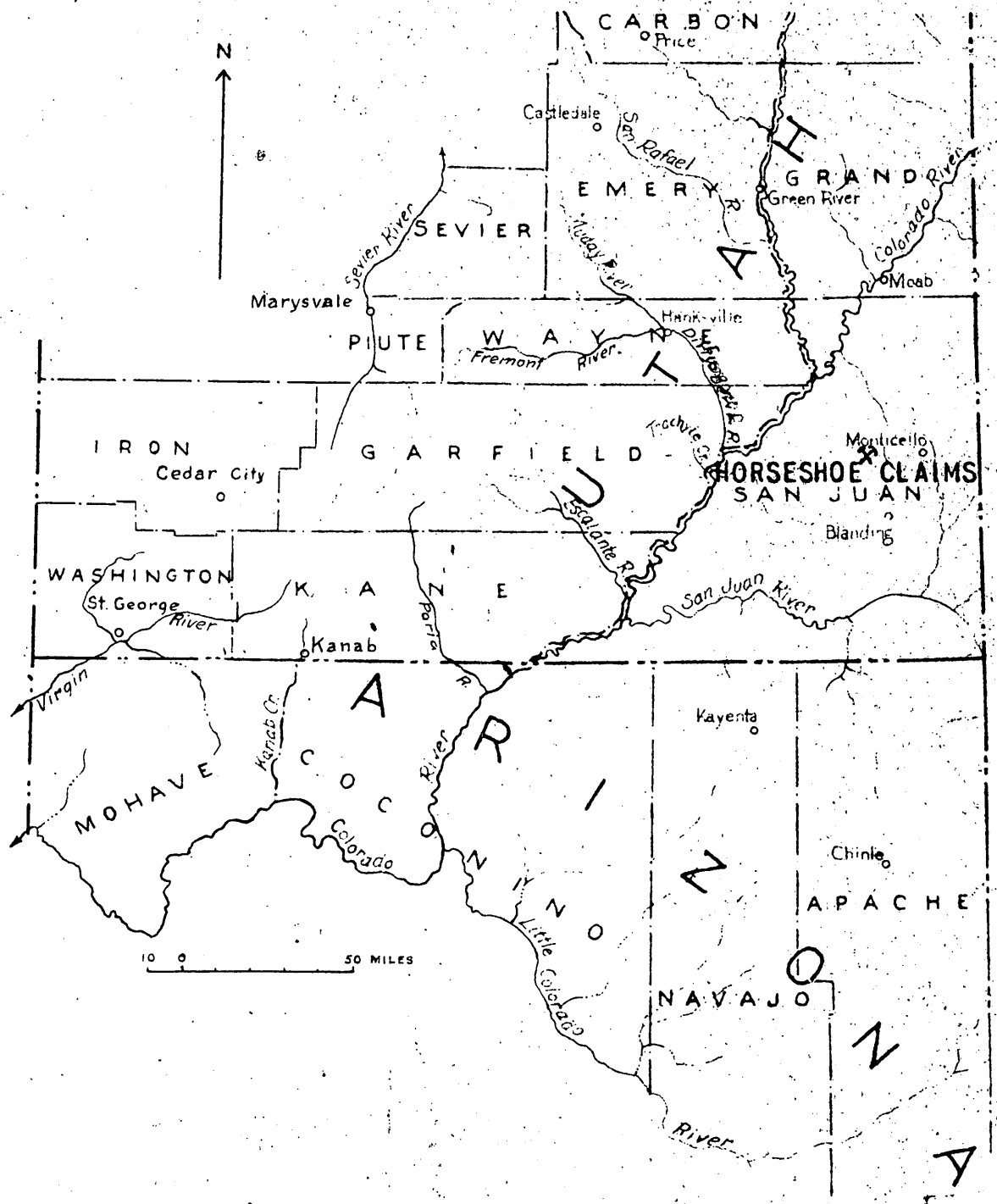

Figure 1. MAP OF PART OF THE COLORADO PLATEAU SHOWING LOCATION OF THE HORSESHOE CLAIMS

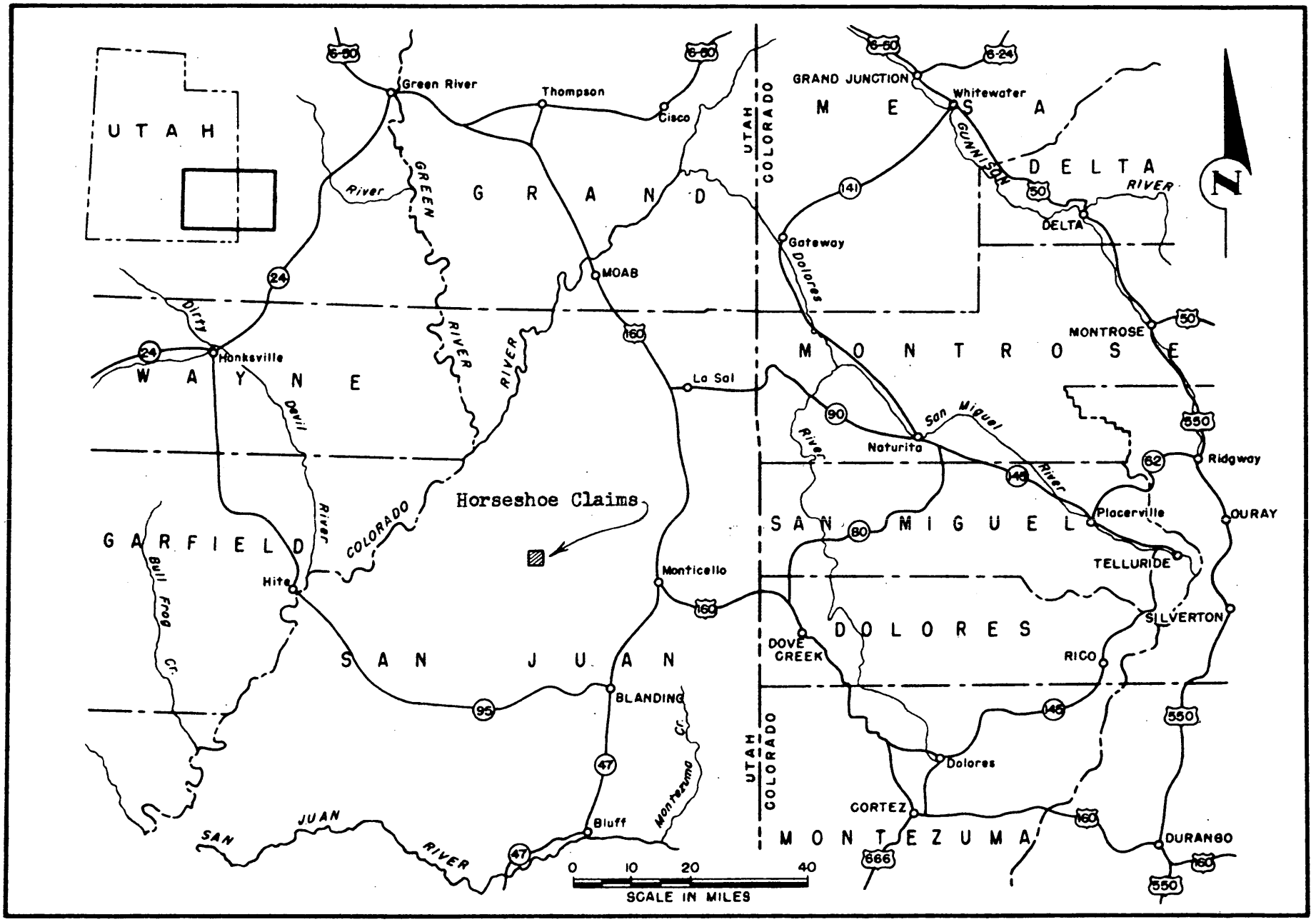

FIGURE 1 - LOCATION MAP, HORSESHOE CLAIMS NO'S 2 & 4, N.B. KNIGHT SR., SAN JUAN COUNTY, UTAH (DMEA 3383)

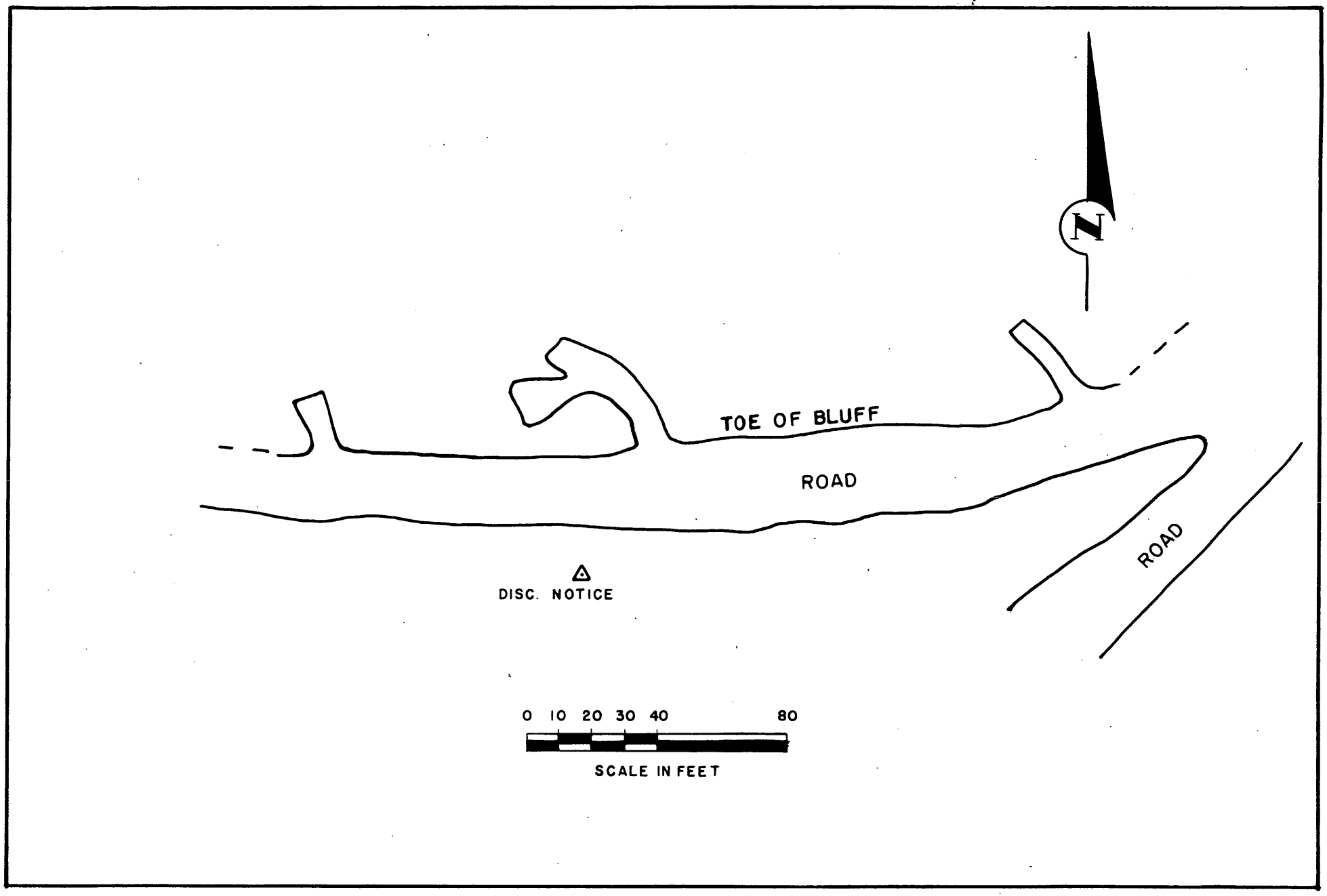

FIGURE 3 – MAP SHOWING WORKINGS ON HORSESHOE CLAIM NO.2, N.B. KNIGHT SR., SAN JUAN COUNTY, UTAH (DMEA 3383)

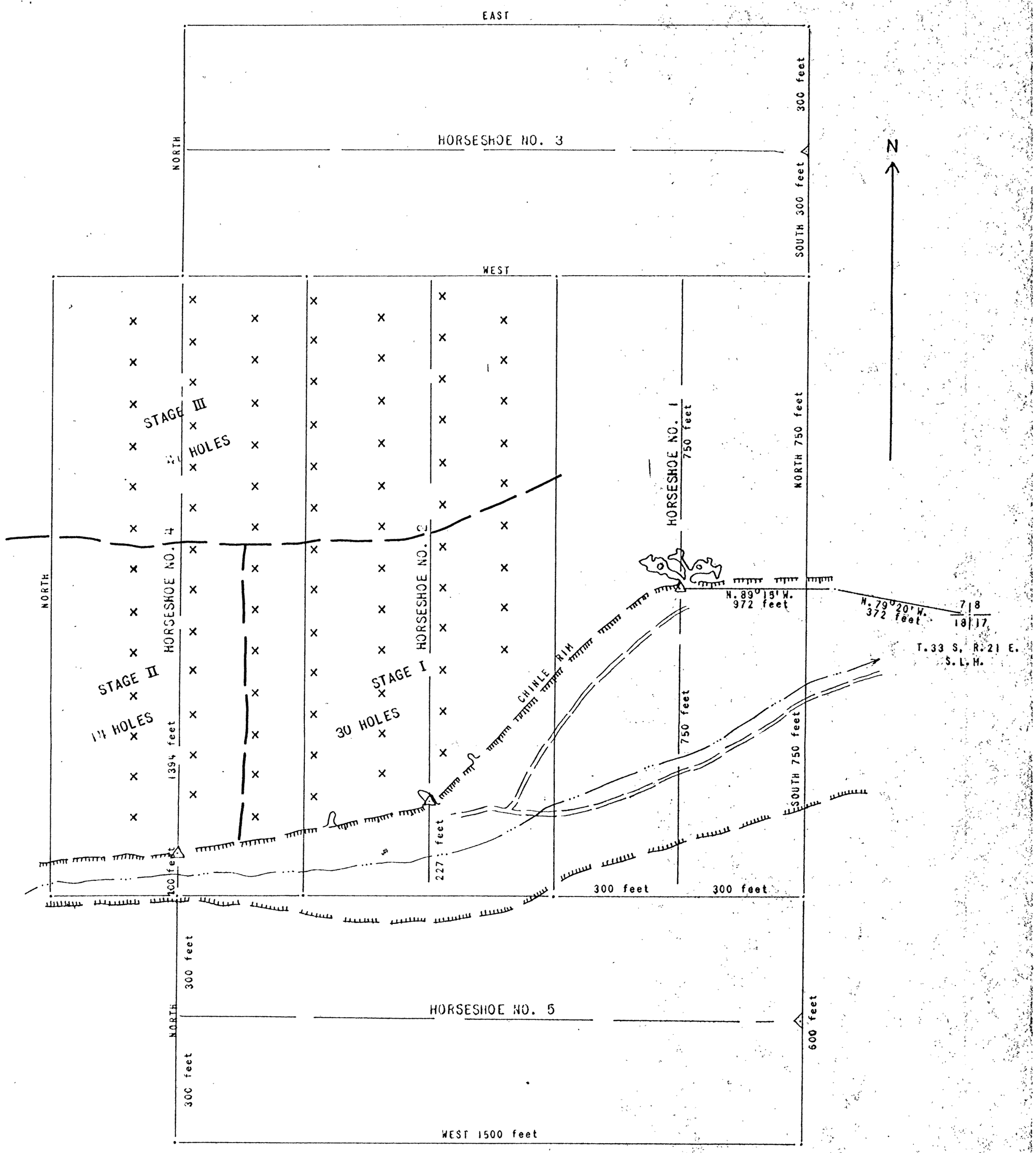

Figure 2. SKETCH MAP OF HORSESHOE CLAIMS SHOWING MINE WORKINGS AND LOCATION OF DRILL HOLES RECOMMENDED FOR DRILLING WITH DMEA AID